**User Stories**

This is used to document the various user stories associated with various projects within the Autonomous Flight Systems Laboratory.

Note that older user stories are described in other documents (for example user\_stories\_0001\_to\_1000.docx)

Note: Only add user stories if you are experienced with the system. Please see Christopher Lum if you have questions.

Table : Table showing user story sizing and estimated hours for each

|  |  |  |  |
| --- | --- | --- | --- |
| **Size** | **Points** | **Estimated Hours** | **Comment** |
| XS | 1 | 5 | a few hours |
| S | 2 | 10 | a few days |
| M | 3 | 15 | over a week |
| L | 5 | 25 | a few weeks |
| XL | 8 | 40 | takes entire sprint (4 weeks) |

## 1001 – Meadowbrook Flight Test

**Content**

As a member of the CERES team, I would like to test the CERES system in Dempsey Indoor.

**Definition of Done**

[ ] Participate in the Meadowbrook Indoor Flight Test on May 14th, 2016.

**Notes**

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## 1002 – Meadowbrook Flight Test

**Content**

As a member of the CERES team, I would like to test the CERES system in Dempsey Indoor.

**Definition of Done**

[ ] Participate in the Meadowbrook Indoor Flight Test on May 14th, 2016.

**Notes**

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## 1003 – Meadowbrook Flight Test

**Content**

As a member of the CERES team, I would like to test the CERES system in Dempsey Indoor.

**Definition of Done**

[ ] Participate in the Meadowbrook Indoor Flight Test on May 14th, 2016.

**Notes**

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## 1004 – Meadowbrook Data Reduction and GNC analysis

**Content**

As a member of the CERES GNC team, I would like evaluate the success of the Meadowbrook tests.

**Definition of Done**

[ ] Record all data, tlogs, and pictures.

[ ] Analyize the data to find the flight speeds, launch speed, flight path, etc.

[ ] Look into possible explanations of the flight path anomalies.

[ ] Modify the waypoint/control script to accommodate the changes.

[ ] Record all findings and present to the CERES team.

**Notes**

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## 1005 – CERES Airframe repair

**Content**

As a member of the CERES team, I would like repair the CERES airframe for future tests.

**Definition of Done**

[ ] Repair the damage to the airframe.

[ ] Take out the fluid system.

[ ] Re-do the CG analysis to find the correct CG location.

[ ] Re-do the internal airworthiness check. See **Error! Reference source not found.**.

**Notes**

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## 1006 – CERES Airframe repair - Helper

**Content**

See 1005 – CERES Airframe repair

**Notes**

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## 1007 – Magnuson Flight test preparation

**Content**

As an project manager and a member of the CERES team, I would like to ensure the logisitics are ready for the flight test and the necessary parties are informed of the details of the test.

**Definition of Done**

[ ] Hold a join flight test preparation meeting with the CERES team.

[ ] Ensure a pilot will be in attendence.

[ ] Make a packing list and ensure everything is compiled.

[ ] Contact TLG Aerospace to inform them of our intent.

[ ] Rent transporation for the test.

[ ] Pack all supplies.

**Notes**

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## 1008 – Magnuson Flight test preparation - Helper

**Content**

See 1007 – Magnuson Flight test preparation

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## 1009 – Magnuson Flight Test Structures Preparation and Modification

**Content**

As a structures engineer and a member of the CERES team, I would like to ensure the test structures are ready for the indoor flight test.

**Definition of Done**

[ ] Incorporate changes to the build from lessons learned at meadowbrook.

[ ] Test the flight structures and ensure strucutral integretiy during the flight test.

[ ] Find final carrier speeds for test rail and launcher tests and verify they are in the desired range.

[ ] Make any machine shop modifications to ensure final configurations.

**Notes**

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## 1010 – Final Poster Creation

**Content**

As a project manager, I would like to make a poster giving an overview of the project for display at the department’s poster session.

**Definition of Done**

[ ] Seek input from team members for descriptions and diagrams of subsystems

[ ] Design a poster incorporating all elements of the project

[ ] Print out the poster and bring it to the poster session

**Notes**

* A template that would work well for this is located in \CERES\TechnicalDataPackage\ProjectPlan\CERESProjectVision.pptx
* The creator of the poster will not be the only presenter of the poster. All team members will be required to spend equal amounts of time presenting the poster at the department poster session.

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## 1011 – Final Poster Creation - Helper

**Content**

* See 1010 – Final Poster Creation

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## 1012 – CERES Final Design Review Presenter – Position 1

**Content**

As CERES team member, I would like to update TLG Aerospace and the University of Washington aeronautics community on the progress on the CERES capstone project through the presentation of a FINAL Design Review.

**Definition of Done**

[ ] Create a power point presentation and present to Andrew McComas for verification.

[ ] Make a 50 minute long presentation on June 8th, 2016.

[ ] Updates within the FDR should include the following:

**Presentation content:**  Each presentation must contain all of the following information to the best of the team's ability within the time limit.

1. **Presentation (1 pt)**
   1. Grammar:  All grammar must be correct.
   2. Spelling:  All spelling must be correct.
   3. References:  All external references (print, web, etc) must be appropriately cited and appear in an appropriate location in the presentation.
   4. Formatting:  The formatting of the presentation must be clean and legible at an appropriate distance for viewing.
   5. Acknowledgement:  All funding sources must be indicated.  All team members including advisor and mentor must be listed.  All team member contributions must be acknowledged.
   6. Team member verbal engagement:  Each team member must be present for the presentation and participate in answering questions.  Answers must be provided in a professional manner with appropriate detail, clarity and succinctness.
2. **Introduction (1 pt)**
   1. Problem statement:  Clearly indicate the open problem that was to be addressed by the engineering solution of the capstone project.
   2. Motivation/background:  Clearly indicate the justification for the need for the solution, other approaches that have been taken to the problem (and some assessment of them), and any other relevant context of the problem.
   3. Customer specifications:  Clearly indicate any design specifications given by the sponsor (physical, societal, budgetary, regulatory, etc).
3. **Analysis-Based Design Process (1 pt).**  Present the design process from conceptual to detail design.  All projects must demonstrate thorough **analysis-based engineering design**, not just a selection of results.
   1. Project analysis components:  Indicate what elements of engineering analysis were employed as part of this project.  For example, if the project required structural design to decrease component weight, what tools were used to assess stress distribution in the lighter product.
   2. Tools used and justification:  What analytical tools were used and why?  Also include any physical testing or computational testing that was performed to assess and update designs.
   3. Verification of results:  What were your tests for whether your product met the customer design specifications?
   4. What was the process for updating the design?  Specifically, what analytical tools were used to drive this process?
4. **Product and Detail Design (2 pts).**  Present analysis, tests, and analysis/test correlations for the final design in all areas.
   1. Deliverables and end product:  What are the deliverables to the customer?  All deliverables should include a detailed engineering report and design drawings.  Some products may include computational packages and/or code.
   2. Show how the final design meets the requirements. In areas where it does not meet the RFP, discuss why and suggest corrective action.
   3. Final budget and cost.
   4. Final schedule (including any facilities use).  All projects should give a final product development timeline in Gantt chart format or similar.  You are welcome to use whatever software you like.  All timelines must indicate facility use needs (e.g., wind tunnel, 3D printing, software usage, etc), deviations from original schedule, additional items, etc.
   5. Impact/contribution:  Clearly indicate the actual impact of the resulting solution and prototype.
   6. Ethical consideration and environmental impact:  Clearly indicate ethical considerations that are relevant to the problem, design solution, and impact (e.g., public policy/perception, federal policy, clean energy, environmental impact).
   7. Present key lessons and conclusions.

## 1013 – CERES Final Design Review Presenter – Position 2

**Content**

* See 1012 – CERES Final Design Review Presenter – Position 1

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## 1014 – CERES Final Design Review Presenter – Position 3

**Content**

* See 1012 – CERES Final Design Review Presenter – Position 1

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## 1015 – CERES Final Design Review Presenter – Position 4

**Content**

* See 1012 – CERES Final Design Review Presenter – Position 1

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## 1016 – CERES Final Design Review Presenter – Position 5

**Content**

* See 1012 – CERES Final Design Review Presenter – Position 1

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## 1017 – CERES Final Design Review Presenter – Position 6

**Content**

* See 1012 – CERES Final Design Review Presenter – Position 1

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## 1018 – CERES Budget Planning

**Content**

As the financial lead for the CERES team I would like to ensure that all of the reimbursements and finalizations have been done before the end of the project.

**Definition of Done**

[ ] Compile all reimbursments and update the procurement document.

[ ] Create a representation of the CERES subsystem spending.

[ ] Ensure that all team members recived reimbursements

**Notes**

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## 1019 – Visual Anchoring Journal Article

**Content**

As a researcher, I would like to publish the results of the visual anchoring project to a journal article so I can increase visibility of the work.

**Definition of Done**

[ ] Research and identify a journal with high impact factor to submit this work to (see notes)

[ ] Download and read example papers from this journal and use this as a template/example for our article.

[ ] Write a journal article. Some results to incorporate include but are not limited to

[ ] all information from conference paper (see ‘1034 – Visual Anchoring Conference Paper’)

[ ] flight test data

[ ] Coordinate with Chris Lum to submit the article

**Notes**

* Some ideas of journals include (examples located at \\VisualAnchoring\TechnicalDataPackage\JournalArticle\ExampleArticles)
  + AIAA Journal of Aerospace Information Systems
    - \\VisualAnchoring\TechnicalDataPackage\JournalArticle\ExampleArticles\AIAA\_JAIS\_VideoGuidanceUAS.pdf is a VERY similar paper. This also illustrates and example where the paper started as a conference paper and then was promoted to a journal article.
  + AIAA Journal of Aircraft
  + IEEE Transactions on Automatic Control

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## 1020 – CERES Journal Article

**Content**

As a researcher, I would like to publish the results of the CERES project to a journal article so I can increase visibility of the work.

**Definition of Done**

[ ] Research and identify a journal with high impact factor to submit this work to (see notes)

[ ] Download and read example papers from this journal and use this as a template/example for our article.

[ ] Write a journal article. Some results to incorporate include but are not limited to

[ ] description of the aircraft (weights, L/D, propulsion, etc.)

[ ] description of the crop dusting spray system (hardware and software)

[ ] description of path planning software (BARNSTORMER)

[ ] engineering analysis (CFD of spray system, launcher calculations, etc.)

[ ] description of indoor test rail system

[ ] flight test data from indoor test (describe spray coverage tests)

[ ] physical description and block diagram of the system

[ ] flight test data

[ ] Coordinate with Chris Lum to get the article through TLG Aerospace’s internal review process

[ ] Coordinate with Chris Lum to submit the article

**Notes**

* Some ideas of journals include
  + AIAA Journal of Aircraft
    - Example papers from this journal are located at \\CERES\TechnicalDataPackage\JournalArticle\ExampleArticles
  + Precision Agriculture (<http://link.springer.com/journal/11119> )
* Ensure that Andrew McComas is an author of the article
* See [1] for more information

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## 1021 – Mapping Journal Article

**Content**

As a researcher, I would like to publish the results of the mapping project to a journal article so I can increase visibility of the work.

**Definition of Done**

[ ] Research and identify a journal with high impact factor to submit this work to (see notes)

[ ] Download and read example papers from this journal and use this as a template/example for our article.

[ ] Write a journal article. Some results to incorporate include but are not limited to

[ ] description of the aircraft (weights, L/D, propulsion, etc.)

[ ] description of the payload system (Canon S100 and RedEdge)

[ ] results of orthomosaic process

[ ] EO orthomosaics

[ ] DEMs from photogrammatry (Agisoft and Atlas)

[ ] NDVI maps from Agisoft and Atlas

[ ] Repeatability of results (compare results over several flight tests)

[ ] physical description and block diagram of the system

[ ] various flight test data

[ ] Coordinate with Chris Lum to submit the article

**Notes**

* Some ideas of journals include
  + Precision Agriculture (<http://link.springer.com/journal/11119> )
* See [2] for more information

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## 1022 – Arduino with Matlab and Simulink

**Content**

As an AA448 instructor, I would like to recreate the xPC Target environment using an Arduino system so I can use it for AA448 during Winter 2017.

**Definition of Done**

[ ] Coordinate with Chris Lum

[ ] Review documentation written by Mathias H.

[ ] Obtain necessary hardware

[ ] Arduino Due

[ ] breadboard

[ ] components to build biasing circuit

[ ] Obtain necessary software

[ ] Matlab & Simulink (see notes)

[ ] Arduino IDE

[ ] Build the system and perform preliminary testing

[ ] Verify that we can replace lab 1, 2 ,and 3 with this system.

[ ] Present results to research group

[ ] Additional task TBD

**Notes**

* Determine which version of Matlab/Simulink is available on the GUG 205 computers. Also determine which version is available to students on their personal machines. Consult with Chris Lum regarding which version to use.

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## 1023 – Arduino with Matlab and Simulink (Update Documentation)

**Content**

As an AA448 instructor, I would like to update update lab documentation to reflect the new Arduino system so I can use it for AA448 during Winter 2017.

**Definition of Done**

[ ] Coordinate with Chris Lum

[ ] Update lecture notes to reflect the new Arduino system.

[ ] Update lab documentation and procedures to reflect the new Arduino system.

[ ] Review results with Chris Lum

**Notes**

* Lecture notes are written in Mathematica

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## 1024 – Arduino with Matlab and Simulink (Position 2)

See ‘1022 – Arduino with Matlab and Simulink’

## 1025 – Arduino with Matlab and Simulink (Update Documentation) (Position 2)

1023 – Arduino with Matlab and Simulink (Update Documentation)

## 1026 – Custom Mission Planner and ArduPlane Builds

**Content**

As a software developer, I would like to build Mission Planner and Arduplane from source code so that I can make custom modifications to it to support custom flight modes.

**Definition of Done**

[ ] Coordinate with Chris Lum AND Tadej Kosel before starting this user story.

[ ] Follow the steps outlined at \\VisualAnchoring\TechnicalDataPackage\MissionPlannerModification\MissionPlannerBuildNotes.docx and build the custom version of Mission Planner located at \\VisualAnchoring\MissionPlannerUW.

[ ] Walk through the steps outlined at <http://ardupilot.org/dev/docs/buildin-mission-planner.html> to build the latestet version of Mission Planner using Visual Studio.

[ ] Find the latest, stable branch of Mission Planner and download it to a folder similar to the \\VisualAnchoring\MissionPlannerUW folder. Consult with Chris and Gage BEFORE you check this into Perforce.

[ ] Add to the \\VisualAnchoring\TechnicalDataPackage\MissionPlannerModification\MissionPlannerBuildNotes.docx to reflect steps necessary to build the latest version of Mission Planner from source code. Do NOT delete the old notes, simply move these to an Appendix.

[ ] Integrate the custom UW changes into the new version of Mission Planner.

[ ] Verify that you can build this on another machine.

[ ] Verify that this works with the custom flight mode on ArduPlane.

[ ] Check results with Chris and Tadej

**Notes**

* The goal of this story is to take the existing custom UW version of Mission Planner and move these changes to the newer version.
* Be sure to add notes about the relevant version numbers of Mission Planner.
* Print the above mentioned tutorial to a pdf and embed this into the build notes document so that we have this in case the website/link is ever changed.

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## 1027 – Custom Flight Mode Build

**Content**

As a software developer, I would like to create a custom flight mode UW\_MODE\_4 so that I can learn how to write code for the Pixhawk.

**Definition of Done**

[ ] Coordinate with Chris Lum before starting this user story.

[ ] Create a UW\_MODE\_4 in the customized Arduplane and Mission Planner

[ ] This mode should output signals to all 8 output channels. Use simple test signals for each of the channels (for example a slow sin wave on one, a square on another, etc.)

[ ] Connect 8 servos to the Pixhawk and ensure that the servos move as expected

[ ] Determine how to read sensor data from the Pixhawk (for example the roll, pitch, yaw angles).

[ ] Modify the UW\_MODE\_4 to output servo deflections based on the inputs (for example change the type of output signal depending on what pitch angle the Pixhawk is experiencing)

[ ] Integrate this on the HiL

[ ] Check in changes to GitHub

**Notes**

* Check Gage’s UW\_MODE\_1 and use it as a reference.

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| 1028 – AFSL Large Multi-Rotor Build **Content**  As a UAS operator, I would like to assemble a large scale, professional multi-rotor system that I can use as a research platform for AFSL endeavors.  **Definition of Done**  [x] Coordinate with Chris Lum before starting this user story.  [x] Build Multi-Rotor Frame  [x] Organize parts  [x] Install Pixhawk and all electronics  [x] Download mission planner onto multi rotor  [ ] Ensure multi-rotor is airworthy  [ ] Install FPV system  [ ] Install Gimbal and Camera  [ ] Install airspeed sensor  [ ] Ensure aircraft is registered  **Notes**   * Build of User story 973  1029 – ArduCopter Testing and Implementation **Content**  As a UAS operator, I would like to test and implement arducopter into multirotors in the lab, beginning with MARV.  **Definition of Done**  [x] Coordinate with Chris Lum before starting this user story.  [x] Ensure MARV is airworthy and take necessary steps to make sure this is the case  [ ] Test to confirm flight time with a single 1500 mAh battery  [x] Pair MARV with transmitter M (Multirotor Transmitter)  [ ] Test stabilize and loiter modes  [ ] Get MARV registered  [ ] Test auto mode (with waypoints) using a simple square path  [ ] Carry out a fully autonomous mission  [ ] Auto takeoff  [ ] Auto flight path  [ ] Auto land  **Notes**   * Testing of Arducopter to be implemented on Argo  |  | | --- | |  | |

## 1030 – CERES High Start System (Position 1)

**Content**

As a UAS operator, I would like to implement the high start launching mechanism for CERES.

**Definition of Done**

[x] Coordinate with Chris Lum before starting this user story.

[x] Research different high start bungee designs.

[x] Make modifications to High Start System to make CERES airworthy.

[x] Fix CERES damages from flight test (7/15/16)

## 1031 – CERES High Start System (Position 2)

**Content**

As a UAS operator, I would like to implement the high start launching mechanism for CERES.

**Definition of Done**

[x] Research different high start bungee designs.

[x] Acquire parts for high start system.

[x] Draft designs for PVC base.

[x] Assemble PVC base.

[x] Install hooks into CERES.

[x] Fix CERES damages from flight test (7/15/16).

## 1032 – CERES High Start System (Position 3)

**Content**

As a UAS operator, I would like to implement the high start launching mechanism for CERES.

**Definition of Done**

[x] Research different high start bungee designs.

[x] Acquire parts for high start system.

[x] Assemble PVC base.

[x] Install hooks into CERES.

## 1033 – PAM ICPA Preparation

**Content**

As a UAS researcher, I would like to prepare for a conference presentation.

**Definition of Done**

[x] Register for the ICPA

[x] Make travel accomadations

[x] Make a rough draft of slides with reference to the lab template and the Australia Study Abroad version

[x] Meet with Dr. Lum regarding the slides and presentation content

[x] Make a final draft of slides

[x] Practice presenting

[x] Present during a lab-wide meeting to get feedback

[x] Refine presentation

**Notes**

## 1034 – Visual Anchoring Conference Paper

**Content**

As a researcher, I would like to publish the results of the visual anchoring project to a conference paper

so I can increase visibility of the work.

**Definition of Done**

[ ] Research and identify a conference to attend

[ ] Write a conference paper. Some results to incorporate include but are not limited to

[ ] description of the outer loop orbit controller

[ ] description of the image processing algorithm

[ ] description of how to obtain slant range

[ ] simulation results of the visual anchoring system (both in Simulink and ArduPlane/JSBSim)

[ ] physical description and block diagram of the system

[ ] Coordinate with Chris Lum to submit the paper

**Notes**

* Eventually we want this work to be published in a journal (see user story ‘1019 – Visual Anchoring Journal Article’)
* Some ideas of conferences are
  + AIAA SciTech (<http://www.aiaa-scitech.org/> )
    - We likely need to publish in SciTech 2018
    - Abstract likely due on June, 2017
  + American Control Conference (<http://acc2017.a2c2.org/index.html> )
    - This will be in Seattle, WA
    - Draft manuscript due Sept. 19, 2016

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## 1035 – GROVER Operational Checklists And Notes

**Content**

As a researcher, I would like to create an operators manual for GROVER.

**Definition of Done**

[x] Check the maintenance and performance of GROVER

[x] Coordinate with Chris Lum

[x] Create a generic Skywalker 1900 aircraft flight manual (AFM) (see \\FlightOperations\UAS\Skywalker\_X8\UW\_Skywalker\_X8\_AFM.docx

[x] Reorganize the information in the \\FlightOperations\UAS\GROVER\OperationalChecklistsAndNotes.docx document and use this to create and aircraft flight manual for GROVER (for example see how \\FlightOperations\UAS\HAPRA\HAPRAAircraftFlightManual.docx is derived from the generic Skywalker X-8 manual)

[ ] Delete the old document and ensure the new document has an official publication number and update the file \\TechnicalDataPackage\AFSLPublicationNumbers.docx

[ ] Review results with Chris Lum

[ ] Present results to research group.

**Notes**

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## 1036 – JCATI Flight Test TRAPIS Operator Training

**Content**

As a JCATI flight test member, I would like to learn how to use the TRAPIS software package.

**Definition of Done**

[ ] Familiarize yourself with the TRAPIS user interface by building and running the TRAPIS solution

* Code located at \JCATI2015\Software\UW\TRAPIS\TRAPIS.sln
* If you need help with this step, consult with Bobby Larson
* Ensure you know how to pair vehicles and save the data to KML files at the end of a test run

[ ] Review LAMS simulator documentation

* Documentation located at \JCATI2015\Software\ANPC\LAMS\_User\_Guide.docx
* Ensure you know how to use the LAMS simulator between two machines in order to simulate a LAMS data stream
* Test the LAMS simulator by connecting two machines and ensuring that the LAMS information from the simulator can be ingested with the TRAPIS user interface

[ ] Familiarize yourself with the TRAPIS Simulator code by building and running the TRAPIS Simulator

* \JCATI2015\Software\UW\TRAPISSimulator\TRAPISSimulator.sln
* If you need help with this step, consult with Bobby Larson

[ ] Perform a test of the TRAPIS user interface while running the TRAPIS Simulator code

* Pair all appropriate LAMS and ADSB streams with the TRAPIS user interface
* Write all simulation information (data streams, estimates, fusers) to KML files
* Ensure that KML files can be read in Google Earth

[ ] Perform additional tests as necessary to become comfortable with the TRAPIS user interface, specifically with pairing LAMS and ADSB data streams for an aircraft

[ ] Familiarize yourself with the JCATI 2015 flight test document

* The document is located at \FlightOperations\Operations\Missions\16\_09\_22\_dallesport\MissionDocument.docx
* Ensure you are familiar with the proposed flight plans for pairing of LAMS and ADSB data streams

**Notes**

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## 1037 – JCATI Flight Test Payload Technician Training

**Content**

As a JCATI flight test member, I would like to learn how to use the TRAPIS payload

**WARNING: Do not attempt to turn on the TRAPIS payload without first consulting with Bobby Larson. Failure to properly protect the transponder before power-up will result in significant damage to the unit.**

**Definition of Done**

[ ] Familiarize yourself with the TRAPIS payload user manual

* Manual located at \FlightOperations\UAS\CommonDocuments\ADSBPayload\ADSBPayloadUserManual.docx
* Ensure you know how to operate the TRAPIS payload

[ ] Familiarize yourself with the Arduino code associated with the TRAPIS payload

* Documentation located at \FlightOperations\UAS\CommonDocuments\ADSBPayload\ADSBPayloadUserManual.docx
* Ensure you know how to change necessary parameters in the Arduino code for the TRAPIS payload

[ ] Perform a test with the transponder to ensure everything works as planned

* Consult with Bobby Larson before conducting this test
* Do not perform this test near the AERB

**Notes**

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## 1038 – JCATI Flight Test Clarity Receiver Technician Training

**Content**

As a JCATI flight test member, I would like to learn how to use the Clarity ADSB receiver

**Definition of Done**

[ ] Familiarize yourself with the Clarity ADSB receiver user manual

* Manual located at \JCATI2015\TechnicalDataPackage\ManufacturerDocs\Sagetech\DOC7015R01-Clarity User Manual.pdf
* Ensure you know how to operate the Clarity Receiver with an iPad

[ ] Familiarize yourself with the WingX app installed on the AFSL iPad

* Ensure you know how to connect the Clarity ADSB receiver with the AFSL iPad for use with WingX 7
* If you have trouble with this step, consult with Bobby Larson

[ ] Walk around campus with the WingX app open and the Clarity receiver to ensure air traffic information can be received and tracked

* If you have trouble with this step, consult with Bobby Larson

[ ] Consult with the lab member completing US 1036

* Ensure both lab members understand the basics of the Clarity ADSB receiver
* Ensure both lab members understand how the information from the Clarity ADSB receiver works into the TRAPIS user interface

**Notes**

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## 1039 – Using Mission Planner to execute Python scripts and output distance to home data to an external computer

**Content**

As a JCATI researcher, I would like to learn how to export distance to home data to an external computer.

**Definition of Done**

[ ] Review and familiarize myself with Tadej’s work with using mission planner to execute python scripts.

[ ] Find code for writing a python script that opens a UDP connection to external computer

[ ] Open a UDP port from a Python script

[ ] Integrate Python script into Mission Planner

[ ] Successfully view distance to home data on an external computer

**Notes**

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## 1040 – JCATI Drone Procurement and SDR board testing

**Content**

As a JCATI researcher, I would like to procure a drone for testing the SDR board, and then determine its ability to test the SDR board.

**Definition of Done**

[x] Determine a drone to use for testing the SDR

[ ] Procure drone

[x] Work with Keith to do this

[ ] Determine how to mount SDR

[ ] Mount SDR

[ ] Test the Drone to make sure it can sufficiently carry out testing of the SDR

**Notes**

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## 1041 – 3D Printing Parts

**Content**

As a manufacturing engineer, I would like to utilize 3D printers so that I can use it to manufacture parts and prototypes.

**Definition of Done**

[x] Coordinate with Chris Lum before starting this story

[x] Read about avaliable 3D printers at: <http://www.aa.washington.edu/operations/equipment.html>

<http://comotion.uw.edu/makerspace>

[x] Determine how to use the printer for fabricating parts.

[x] Generate a prototype part.

[x] Document the process/workflow used.

[x] Present results to the research group

[x] Check in document in the appropriate location in Perforce (coordinate with Chris Lum before uploading data).

**Notes**

 User story is similar to 487 – UWAA 3D Printing Investigation.

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## 1042 – Vulcan SLA-1500 Configuration

**Content**

As a researcher, I would like to partner with Vulcan to configure a SLA-1500 camera on a skywalker 1900

**Definition of Done**

[x] get the camera configured and taking data

## 1043 – Vulcan SLA-1500 Documentation

**Content**

As a researcher, I would like to write instructions and procedures for the SLA-1500 Camera

**Definition of Done**

## 1044 – Flight Operations Work Items

**Content**

As a UAS operator, I would like to address the following items so that flight operations will be more effective and efficient.

**Definition of Done**

HIGH PRIORITY

[x] Start a training program for simulator, etc

[x] Create a system to track parts

[x] Research and purchase a communication solution that can be used for the KDLS mission. Two parties will be separated by approximately 3SM with line of sight. We need a solution that does not infringe on air band frequencies.

[x] Obtain an ADS-B in receiver that can pair with an iPad to display traffic for the flight team at KDLS.

[x] Read AC 107-2 and ensure that policies and checklists for the lab allow us to be part 107 compliant

[ ] Ensure to-do items on MFOC construction and maintenance log are complete

[ ] Ensure to-do items on TEDD construction and maintenance log are complete (Scott)

[ ] Ensure to-do items on Luke construction and maintenance log are complete

[ ] Ensure to-do items on Leia construction and maintenance log are complete

[x] Ensure all flight logs have time stamping macro embedded in it. (Scott)

[x] Encourage part 107 certification

[x] Configure RF spectrum analyzer (Scott)

[x] Get ucar account

[ ] Update Talon AFM supplement (Scott)

[x] Add stickers, decals, logos, etc to aircraft to make them “camera ready” (Aaron)

[x] Ensure AMA safety code compliance

[x] Test out the CB radio communication solution

[x] Find a solution to secure the aircraft wings to the trailer shelves

[x] Rename “Cold Weather Gear” box to “Outdoor Gear Box” (so it can include sunglasses, rain gear, etc.)

[x] Look into throttle and autopilot issue

MEDIUM PRIORITY

[ ] Start a “maintenance manager” spreadsheet. This should track critical items such as autopilots, transmitters, etc. and note when they need periodic service or maintenance.

[x] Research and purchase a spectrum analyzer (to identify radio frequency activity in bands necessary for operations such as 915 MHz, 2.4 GHz, 5.8 GHz, 1090 MHz, 978 MHz, 20ish MHz, 120ish MHz, 800 MHz-5.8 GHz etc.)

[x] Review job descriptions and once finalized, print out in small, card sized pieces. Laminate these pieces and attach them to the MFOC so they can be handed out to participants during operations. (Sue)

[x] Reorganize and relabel all shelves in the lab (boxes should probably be organized by size/function)

[ ] Reorganize and relabel all shelves in the MFOC

[ ] Perform full aircraft registration for Argo (so we obtain an N-number and ICAO address, talk with Chris Lum)

[x] Build a battery charging station in the lab (aircraft LiPo batteries, DeWalt batteries, AA batteries, etc.) (Chris)

[x] Make a charger so we can charge the Dominator goggles (Scott)

[ ] Reorganize lab member certifications (see \\FlightOperations\Operators\Certifications). This should contain a way to track a given member’s certifications (FAA, FCC, AMA, etc.) and note when they expire. Collect and sort

[ ] Get Procard

[x] Contact Vulcan for how they would like to proceed with the Talon

LOW PRIORITY

[ ] Obtain lab member certifications (private pilot license documentation, remote pilot certifications, HAM radio, etc.) and archive these in \\FlightOperations\Operators\Certifications

[ ] Establish emergency procedures for lost-link, flyaway, etc. Integrate these into the checklists and conduct training for all operators

[x] Review and update the \\AFSL\LabInfo\LabSafety.docx, especially the safety and performance regarding LiPo battery safety. Brief all group members regarding proper LiPo battery safety (do this at a group meeting).

[ ] Plan for and conduct a LiPo battery fire drill (talk with Chris Lum)

[x] Procure more canopy bolts for the Skywalker 1900 aircraft.

[ ] Ensure to-do items on Argo construction and maintenance log are complete

[ ] Ensure to-do items on MARV construction and maintenance log are complete

[x] Rearrange and evaluate the state of AFSL deep storage in the Kirsten Wind Tunnel

[ ] Add a python interpreter on AFSLPrecision02

[ ] Write a user story for Matlab ArduCopter analysis

[ ] Ensure MARV AFM is satisfactory.

[x] Build a landing platform for multirotor aircraft. This can be as simple as a sheet of plywood strapped on top of the two large Husky storage boxes.

[ ] Ensure all lab members have completed lab safety training and signed form in \\FlightOperations\Operators\Certifications\AFSL\_safety

[ ] Ensure all lab members have liked/followed the lab facebook page

**Notes**

* These items do not need to be completed within a single sprint, they can be broken up into multiple user stories.

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## 1045 – JCATI 2015 KalmanFuser Code Updates

**Content**

As a software developer, I would like to ensure that the KalmanFuser code associated with the JCATI 2015 project works in a variety of scenario simulating GPS-degraded and GPS-denied flight operations.

**Definition of Done**

[ ] Test the KalmanFuser code with a variety of scenarios within the TRAPIS software framework to ensure that it handles GPS-degraded and GPS-denied environment scenarios

[ ] Make changes to the KalmanFuser code as necessary to ensure such flight scenarios are handled accordingly

[ ] Test the KalmanFuser code in TRAPIS while using the LAMSSimulator software to ensure that aircraft pairings remain regardless of GPS integrity

[ ] Ensure that new KalmanFuser code gets tested in the field

**Notes**

* New KalmanFuser code was tested during 08/25/16 Meadowbrook Farms flight test using transponder flown on Leia aircraft

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## 1046 – ADS-B Transponder Integration on Leia Aircraft

**Content**

As a flight technician, I would like to integrate the TRAPIS ADS-B payload on the Leia Skywalker 1900 aircraft and test the implementation to ensure that it works appropriately.

**Definition of Done**

[ ] Mount the ADS-B payload into the payload bay of the Leia aircraft and ensure that the ADS-B antenna is placed in a manner required to avoid electromagnetic interference

[ ] Ensure that transponder can be powered on in standby mode indoors to avoid possible conflicts with air traffic control

[ ] Perform a ground test of the Leia aircraft to ensure all control surfaces work with the transponder powered on in standby mode

[ ] In the field, perform a ground test of the Leia aircraft with the transponder operating on ALT mode. Ensure that all aircraft control surfaces work regardless of transponder operation, and ensure that the transponder can be seen using the WingX software with the Clarity ADS-B In receiver

**Notes**

* Ground test performed during 08/25/16 flight test at Meadowbrook Farms

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## 1047 – ADS-B Transponder Payload Flight Test

**Content**

As a flight technician, I would like to test the integration and implementation of the transponder ADS-B payload on the Leia Skywalker 1900 aircraft.

**Definition of Done**

[ ] Mount the ADS-B payload into the payload bay of the Leia aircraft and ensure that the ADS-B antenna is placed in a manner required to avoid electromagnetic interference

[ ] Ensure that user story 1046 has been completed to include all required ground testing

[ ] Ensure that the transponder operates and can be tracked in TRAPIS in three flight scenarios

* GPS signal provided to the transponder is not being altered in any manner
* GPS signal provided to the transponder is being degraded to a NACp value of 8
* GPS signal provided to the transponder is being artificially denied (per documentation for Arduino Mega board code associated with transponder)

[ ] Ensure that ADS-B payload can be recovered on the aircraft after the flight tests without damage or other incident

**Notes**

* Flight tests performed during 08/25/16 flight test at Meadowbrook Farms

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## 1048 – Perforce Visual Client (copy)

See User Story **Error! Reference source not found.**

**1049 – Luke ADS-B Transponder Payload Construction**

**Content**

As a payload technician, I would like to create a second ADS-B transponder payload to incorporate into the Luke aircraft for use in the JCATI 2015 flight demonstration.

**Definition of Done**

[ ] Acquire all parts necessary to create a second ADS-B payload for use with the Luke aircraft

[ ] Acquire a second XPS-TR ADS-B transponder from Sagetech for use with the payload

[ ] Construct the second transponder payload as required for the Luke aircraft

[ ] Perform a test with the second transponder payload during the 09/09/16 Meadowbrook TRAPIS dress rehearsal flight test

**Notes**

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**1050 – Soldering LiPo Batteries**

**Content**

As a payload technician, I would like to prepare new LiPo batteries to be used for various operations.

**Definition of Done**

[x] Acquire all parts necessary to solder XT60 connections onto the batteries

[x] Apply Velcro to each battery

[ ] Charge each battery if they are below 95% of a charge

**Notes**

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**1051 – Skywalker 1900 Repairs and Construction**

**Content**

As a construction engineer, I would like to repair all currently operating Skywalker 1900s to be airworthy.

**Definition of Done**

Repair damages occurred from flight testing, such as:

[x] Epoxy and reinfornce face and various cracks on the fuselage

[x] Inspect T-nut construction on the tail

[x] Epoxy the horizontal stabilizer onto the tail

[x] Install manufactured parts onto all 1900s

Manufacture necessary parts, such as:

[x] 3D print supports for the horizontal stabilizer

[ ] Potential plates to if there is a second battery on the TRAPIS payload

[ ] Model and construct Vulcan Camera cover to fit in TEDD

[] Create an inspection schedule for all 1900s

**Notes**

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**1052 – CERES and High Start Modification (Position 1)**

**Content**

As a UAS operator, I would like to prepare CERES to be test-flown again.

**Definition of Done**

[x] Repair the damage to CERES from the most recent unsuccessful experiment.

[x] Shorten the center lengths of the high start so that CERES will be more stable on the rails.

[x] Shorten the front uprights of the high start so that the takeoff angle will be less steep.

**Notes**

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**1053 – CERES and High Start Modification (Position 2)**

**Content**

As a UAS operator, I would like to prepare CERES to be test-flown again.

**Definition of Done**

[x] Repair the damage to CERES from the most recent unsuccessful experiment.

[x] Shorten the center lengths of the high start so that CERES will be more stable on the rails.

[x] Shorten the front uprights of the high start so that the takeoff angle will be less steep.

**Notes**

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**1054 – Decals and Lab Information**

**Content**

As a UAS operator, I would like to add necessary decals to the UAS fleet for regulatory and PR purposes.

**Definition of Done**

[x] Add decals as deemed appropriate to aircraft, so that they clearly belong to the University of Washington and AFSL.

[ ] Print more decals.

[ ] Add aircraft names to any aircraft that are not labelled.

[ ] Add contact information to any aircraft that do not have it.

**Notes**

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**1055 – Part 107 Test Preparation**

**Content**

As a researcher, I would like to prepare for and take the FAA Part 107 Commercial Remote Pilot Certification test.

**Definition of Done**

[x] Take the online course offered by the FAA

[x] Take the three practice tests on the network drive

[x] Study all topics identified as weak when taking practice tests

[x] Take the part 107 test

[x] Do the paperwork to get the license from the FAA

[x] Do the paperwork to get reimbursed for test

**Notes**

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**1056 – Fat Shark Dominator V3 Head Tracking Configuration**

**Content**

As a researcher, I would like to configure the Fat Shark Dominator head tracking googles with a FPV camera.

**Definition of Done**

[x] Assemble Fat Shark Dominator with gyro and receiver modules

[x] Establish connection between Dominator to A/V transmitter

[x] Configure Turnigy 9X transmitter to connect to Dominator googles

[x] Test googles to ensure head tracking FPV camera is properly working

**Notes**

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**1057 – Flight Operations Work Items (Position 1)**

**Content**

As a UAS operator, I would like to address the following items so that flight operations will be more effective and efficient. See user story 1044 for the full list.

**Definition of Done**

[x] Ensure to-do items on TEDD construction and maintenance log are complete

[x] Ensure all flight logs have time stamping macro embedded in it.

[x] Make a charger so we can charge the Dominator goggles

[x] Configure RF spectrum analyzer

[x] Create a new flight plan for TEDD for 9/16/16 meadowbrook excursion

**Notes**

* These tasks are copied from user story 1044

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**1058 – Flight Operations Work Items (Position 2)**

**Content**

As a UAS operator, I would like to address the following items so that flight operations will be more effective and efficient. See user story 1044 for the full list.

**Definition of Done**

[ ] Review job descriptions and once finalized, print out in small, card sized pieces. Laminate these pieces and attach them to the MFOC so they can be handed out to participants during operations.

**Notes**

* These tasks are copied from user story 1044

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**1059 – AFSL Battery Charging Station**

**Content**

As a lab member, I would like to set up a battery charging station in the lab for lipo, Android, Apple, and general chargers.

**Definition of Done**

[ ] Mount battery checker to station

[x] Create a bucket for “Needs Charging” batteries

[ ] Post nominal voltages for various batteries

[ ] Create a bucket for lipo safe bags and terminator caps

[x] Post fire extinguisher nearby

[ ] Create a sand box for battery safety

[ ] post list of safety/best practices

**Notes**

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## 1060 – EDF Jet Research

**Content**

As a UAS operator, I would like to research different EDF Jets for purchase

**Definition of Done**

[x] Coordinate with Chris Lum before starting this story.

[x] Research different EDF jets that can properly hold Pixhawk payload

[x] Research different FPV camera and gimbal that can be mounted on EDF jet

[x] Make a recommendation to Chris Lum regarding which systems to procure

**Notes**

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## 1061 – Talon UAS

**Content**

As a UAS operator, I would like to research the specifications of the Talon UAS for mapping with the SLA-1500

**Definition of Done**

[ ] Investigate Talon UAS

[ ] Update Talon AFM supplement

[ ] Investigate the feasibility of having the SLA-1500 as a payload

[ ] Obtain footage from the SLA-1500 using the Talon UAS

**Notes**

* Tasks to be updated.

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## 1062 – Camera Research for Lab

**Content**

As a lab member, I would like to research a digital SLR camera and a handheld camcorder for the lab.

**Definition of Done**

[ ] Research two different camers with the following requirements:

1. Digital SLR:
   1. Ability to auto refocus when taking video
   2. Ability to be carried on Argo
   3. Reasonable optical zoom range (probably lens specific)
2. Camcorder
   1. Reasonable optical zoom range (not digital zoom)
   2. Writes files to a SD card
   3. 1080p resolution

[ ] Provide Dr. Lum with a few of the best options for each kind of camera considering cost and quality

**Notes**

* We want the camcorder to record flights and the digital SLR to take publicity photos and pictures of animals (like elk)

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## 1063 – Arduplane Parameter Standardization

**Content**

As a researcher, I would like to check all of the arduplane parameters to standardize them.

**Definition of Done**

[x] Check all arduplane parameters across the fleet to ensure that they are all standardized. The standardize paramters should be documented here: C:\dev\FlightOperations\UAS\CommonDocuments\ArduPlane\OperationalChecklistsAndNotes.docx

[x] Use this as a way to get familiar with all the parameters

[x] Alert Dr. Lum of any parameters that need changing or fix as necessary

[x] Fix parameters to allow full throttle on takeoff

**Notes**

* For example, the flight modes should all be the same and the arming procedures should be the same.  However things like the sensor offsets are specific to each aircraft.
* Throttle issue: it appears that when in stabilize mode, the autopilot handicaps the maximum throttle

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## 1064 – Rebuilding CONDOR

**Content**

As a lab member, I would like to rebuild CONDOR in support of the Visual Anchoring Team.

**Definition of Done**

[X] Receive Skywalker 1900 from lab and familiarize myself with kit.

[X] Research available documentation on Perforce and online to learn build best practices.

[X] Assemble 1900 airframe.

[X] Integrate all standard electrical components (Power, Servos, Pixhawk, Motor, etc).

[X] Integrate RxMUX board for redundant flight control independent of Pixhawk.

[X] CONDOR re-built and ready for flight.

**Notes**

* Build new Skywalker 1900 airframe.
* Build new power system, including power module, 2 power switches, and 65A ESC.
* Integrate the RxMux with the pixhawk configuration.
* Design with the intent of adding a 2 or 3 axis camera gimbal system later on.

The build was very time consuming with all the research required to bring myself up to speed on Skywalker 1900 builds. The slight differences in integrating the RxMux was also time consuming and educational. We will be proceeding with a very robust pre-flight check process to ensure that systems are all functioning properly and consistently.

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## 1065 – Skywalker 1900 Flight Characteristics

**Content**

As a lab member, I would like to use flight data to determine some of the Skywalker 1900 flight characteristics.

**Definition of Done**

[ ] Determine power off and power on stall speeds

[ ] Generate power required curve vs. weight vs. CG

[ ] Create a table to determine minimum safe airspeed depending on weight/cg/payload

**Notes**

* Tasks to be updated as they arise

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## 1066 – Checklists Software Research

**Content**

As a lab member, I would like to research preexisting software or programs available for creating and using checklists.

**Definition of Done**

[X] Research systems with the following criteria:

* Ability to have common checklists that are automatically pulled into different UAS checklists (i.e. we always check the battery on all systems, so we don’t want to repeat this over all the checklists)
* Ability to make note of who completed each item and when

[X] Determine if one or more systems currently exist

[X] If they do exist find one or more that we can try to see which works best

**Notes**

* Tasks to be updated

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## 1067 – Pre-Quarter Lab Cleanup

**Content**

As a lab member, I would like to clean up the lab space so that we can start the quarter off right.

**Definition of Done**

[ ] Find RF dummy load

[ ] Safely store LiPo batteries

[ ] Clean up lab

[ ] Clean up MFOC

**Notes**

* Everyone will participate in this one

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## 1068 – Create a TRAPIS Promo Video

**Content**

As a lab member, I would like to create a promo video of the TRAPIS system to be shared on YouTube and the website.

**Definition of Done**

[ ] Gather video/photos of TRAPIS project

[ ] Put together a promo video to allow general public to understand the impact of the work

[ ] Share video online

**Notes**

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## 1069 – Build Falco

**Content**

As a lab member, I would like to assemble Falco and make it airworthy.

**Definition of Done**

[ ] Assemble Falco with Pixhawk system, GPS, telemetry, and servos

[ ] Create a flight manual for Falco

**Notes**

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## 1070 – Create Landing Platform

**Content**

As a lab member, I would like to create a landing/takeoff platform for MARV and Argo.

**Definition of Done**

[ ] Create a viable platform using plywood and other materials so that MARV and Argo can land on something that is safely above the ground.

**Notes**

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## 1071 – Ensure Safety Survey Compliance

**Content**

As a lab member, I would like to make sure the lab is compliant with safety regulations.

**Definition of Done**

[ ] Look at lab safety survey results filed under \AFSL\LabInfo\SafetyInspections\16.09.25\_SafetySurveyResult.pdf

[ ] Address the required changes (red items with comments)

**Notes**

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## 1072 – Review Visual Anchoring Conference Paper

**Content**

As a lab member, I would like to get up to review the Visual Anchoring Conference Paper.

**Definition of Done**

[ ] Learn about the Visual Anchoring Project

[ ] Annotate difficulties that I have following specific parts of the conference paper

**Notes**

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## 1073 – Set Up Simulator

**Content**

As a lab member, I would like to set up the RC simulator.

**Definition of Done**

[ ] Connect a transmitter to the simulator

[ ] Make sure everything is configured

[ ] Test!

**Notes**

## 1074 – Update Inventory Doc

**Content**

As a lab member, I would like to update the inventory document to make sure it accurately reflects what is available in the lab and MFOC.

**Definition of Done**

[x] Access inventory list at \AFSL\LabInfo\EquipmentInventory\EquipmentInventory.docx

[x] Go through each equipment box in the AFSL and make sure that the inventory document reflects in just enough detail that someone looking for a certain item can look at the document and know which box to look in

[x] Relabel boxes or shelves if labels are falling off or improperly marked

[x] If something is clearly in the wrong box, find it a better home

[x] Once completed in the AFSL, make sure that all boxes have a labelled home in the MFOC (this may need to wait until everything is loaded into the trailer to see how it all fits)

**Notes**

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## 1075 – Add Parts into Component Tracker

**Content**

As a lab member, I would like to add all important parts into the Component Tracker sheet \FlightOperations\UAS\ComponentTracker.xlsx

**Definition of Done**

[ ] For all parts currently on UAS, label with a sharpie and input data into component tracker log

**Notes**

* As time permits, feel free to add in parts that aren’t currently on a UAS as well

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## 1076 – Find New Flight Test Locations

**Content**

As a lab member, I would like to research the possibility and feasibility of new flight test locations that meet Part 107 requirements and lab specific needs.

**Definition of Done**

[X ] Read pertinent sections of AC 107-2 <http://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_107-2.pdf>, namely sections 5.8 and 5.11 and any others that specifiy where sUAS may be operated

[X] Using Google Earth, Google Maps, or another tool, find possible open spaces where we might be able to conduct flight operations in accordance with Part 107 requirements and lab specific needs

[X] Look up Meadowbrook Farm, North Bend for example location <http://www.meadowbrookfarmpreserve.org/>

[X] Look for an additional location(s) where a sUAS might be flown over exotic animals (something other than elk) for photography/research purposes

[X] Determine the pros and cons of each location and report to Hannah

**Notes**

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## 1077 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

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## 1078 – Wind Tunnel Deep Storage

**Content**

As a lab member, I would like to reorganize the lab’s deep storage space in the Kirsten Wind Tunnel.

**Definition of Done**

[ ] Rearrange and reevaluate the deep storage space

[ ] Determine if anything is non-functional or unnecessary and needs to be removed

[ ] Organize in a useful way

**Notes**

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## 1079 – Aircraft Part Familiarization

**Content**

As an equipment technician, I would like to learn about each component that is a part of the UAV.

**Definition of Done**

Familiarization with:

[ ] Servos, push rods, and control horns  
[ ] Motor and propeller  
[ ] Pixhawk  
[ ] Pixhawk connections including:

* Telemetry radio
* Power module
* Electronic Speed Controller (ESC)
* Buzzer and its various sounds
* Arm/disarm switch
* GPS
* External USB port
* Airspeed sensor

[ ] Motor and battery safety switches

[ ] LiPO batteries

[ ] Basic FPV apparatuses (i.e. Mobius camera, A/V Transmitter)

**Notes**

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## 1080 – Equipment Testing

**Content**

As an equipment technician, I would like to ensure the equipment used on each aircraft is ready for use.

**Definition of Done**

[ ] Inspect aircraft to be free of damage  
[ ] Check if the installed battery has above a 90% charge  
[ ] Ensure the 3DR radios (ONLY the knock-off brand radios) are of the correct gender to communicate with the GCS  
[ ] Ensure Pixhawk contains microSD card  
[ ] Test if dataflash and telemetry logs can be gathered on the Pixhawk and GCS, respectively  
[ ] Check motor and propeller orientation

**Notes**

* Recommended to do Aircraft Part Familiarization user story

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## 1081 – Battery Charging

**Content**

As an equipment technician,  I would like to ensure batteries are ready for use.

**Definition of Done**

[ ] Know where the Emergency box is located  
[ ] Check through all the battery boxes for the charge on the LiPO batteries  
[ ] Charge batteries that hold less than 90% of a charge  
[ ] Charge Transmitter batteries  
[ ] Charge AA batteries  
[ ] Charge Mobius cameras and other FPV gear

**Notes**

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## 1082 – Social Media Updates

**Content**

As a lab member, I would like to update the activities of the lab for publicity on the AFSL website, Facebook, and YouTube pages.

**Definition of Done**

[ ] Consult with Chris Lum on the activity’s description and prospective posting photos/videos.

[ ] Frequently post profiles of lab members and their specific involvement in the lab on Facebook.

For every post-flight test:

[ ] Upload selected videos from the flight test onto YouTube.

[ ] Update the video description (follow the template on YouTube)

[ ] Make sure each video tag includes: university of washington autonomous flight systems laboratory uw afsl test (schoolyear e.g. 20162017) (date e.g. 20161119) (location e.g. meadowbrooke farm) (UAS e.g. tedd) run (run# e.g. 001) (title)

[ ] everything is in lowercase

[ ] every word has a space in between

[ ] exclude all the parenthesis

[ ] Make sure the uploaded videos are included in their perspective playlists (it is possible for each video to be in more than one playlist)

[ ] Share the videos uploaded onto YouTube on Facebook.

[ ] Upload selected photos from the flight test onto Facebook.

[ ] Confirm that the photos and videos from each flight test are uploaded onto K drive.

Flight Test:

[ ] “Date (e.g. 20161126)” @ “Location (e.g. Meadowbrooke Farm)”

[ ] “Date (e.g. 20161126)” @ “Location (e.g. Meadowbrooke Farm)”

[ ] “Date (e.g. 20161126)” @ “Location (e.g. Meadowbrooke Farm)”

[ ] Include every additional Flight Test from this quarter here…

[ ] At the end of the quarter, please make a new copy user story 1082 – Social Media Updates for the next quarter.

**Notes**

* This is a quarter long commitment, please only pick it up if you can make the time.
* Every flight test for the quarter is to be included under Flight Test.
* Every video and photo needs to be in its best quality, meaning the videos are to be trimmed, and photos to be cropped if deemed necessary.
* Uploaded videos are automatically distributed into its perspective playlists if tagged correctly.
* Uploaded videos will automatically be shared through Twitter.
* Q&A about video tag: “school year (e.g. 20162017)” is considered from first day of summer courses of that year to the day before the first day of summer courses for the following year.
* **This is the original UserStory [Read-Only], please make a copy it of this at the end of every quarter. Delete this note in the new copy.**

## 1083 – Mission Planner Familiarization

**Content**

As a lab member, I would like to learn how to use Mission Planner.

**Definition of Done**

[ ] Familiarize with Mission Planner user interface and utilization

http://ardupilot.org/planner/docs/mission-planner-overview.html

\\FlightOperations\UAS\CommonDocuments\MissionPlanner\ OperationalChecklistsAndNotes.docx

[ ] Download Mission Planner

[ ] Load a TLog and a Waypoints file from a previous flight for reference

[ ] Successfully Connect to a vehicle via wired and wireless connection

[ ] Create a Waypoints file and test/verify before a flight test or with a senior member

[ ] Familiarize/Perform typical preflight calibrations with help from a senior member

[ ] Airspeed Sensor Calibration

[ ] Radio Transmitter Calibration

[ ] Accelerometer Calibration

[ ] Observe / Practice Data Technician procedures during Flight dates

[ ] Observe / Practice GCS operation / communication procedures during Flight dates

[ ] Familiarize with spotting and fixing errors in Mission Planner

[ ] Create and test a python script

**Notes**

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## 1084 – Part 107 Test Preparation (copy)

**Content**

Copy of user story 1352 – VTOL/QuadPlane**Error! Reference source not found.**

As a researcher, I would like to prepare for and take the FAA Part 107 Commercial Remote Pilot Certification test.

**Definition of Done**

[] Take the online course offered by the FAA

[] Take the three practice tests on the network drive

[] Study all topics identified as weak when taking practice tests

[] Take the part 107 test

[] Do the paperwork to get the license from the FAA

[] Do the paperwork to get reimbursed for test

**Notes**

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## 1085 – Unit Background Testing (copy)

See 006 – Software Developer Background Training (Algorithm and Back End)

See 132 – Unit Testing Beckground Training

**Notes**

Helpful Resources:

<https://www.youtube.com/watch?v=lisiwUZJXqQ> (90 min Crash Course)

<http://www.tutorialspoint.com/csharp/index.htm> (Good for referencing back to)

[https://www.edx.org/course/programming-c-microsoft-dev204x-2](https://www.edx.org/course/programming-c-microsoft-dev204x-2%20%20)  (Will need to sign in, Ends March 31st)

[https://mitseu.files.wordpress.com/2014/08/microsoft\_visual\_c-sharp\_\_2013\_step\_by\_step.pdf](https://mitseu.files.wordpress.com/2014/08/microsoft_visual_c-sharp__2013_step_by_step.pdf%20) (PDF book)

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## 1086 – Falco Pixhawk Assembly

**Content**

As a lab member, I would like to integrate the Pixhawk and its electronic components into Falco.

**Definition of Done**

[ ] Integrate Pixhawk, GPS, power module, I2C bus, airspeed sensor, RC Reciever and telemetry radio.

[ ] Ensure that all connections and components are secured with velcro if necessary.   
[ ] Ensure Falco connects to a transmitter and test control surfaces and throttle

[ ] Research parameters for Falco and write them to Pixhawk

**Notes**

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## 1087 – Falco Aircraft Manual (part 1)

**Content**

As a lab member, I would like write and publish an aircraft manual for Falco

**Definition of Done**

[ ] Write introductions, general information, performance, procedures for Falco.

[ ] Finish as much as possible before conducting an actual flight

[ ] Get approval from Hannah Rotta

**Notes**

* The manual is in \FlightOperations\UAS\Falco\FalcoAircraftFlightManual.docx

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## 1088 – Skywalker 1900 UAS Cradle

**Content**

As a lab member, I would like to assemble another cradle for the Skywalker 1900 UAS

**Definition of Done**

[ ] Gather measurement information of the Skywalker 1900 cradles in the lab

[ ] Gather PVC pipes and joints

[ ] Cut and assemble the pipes

[ ] Label joints and pipes for reassembly

[ ] Test with any Skywalker 1900 to ensure stability

**Notes**

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## 1089 – New AFSL Printer

**Content**

As a lab member, I would like to research and procure a new printer for the lab

**Definition of Done**

[ ] Search for a laser black printer online with Ethernet interface

[ ] Send printer information (URL) to Chris Lum for approval

**Notes**

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**1090 – JCATI 2015 KDLS Flight Demonstration**

**Content**

As a payload engineer, I would like to demonstrate the functionality of the TRAPIS payload and software suite with a fligh demonstration at the KDLS airport with our industry partners.

**Definition of Done**

[ ] Travel to The Dalles, OR from September 21, 2016 through September 23, 2016 for flight testing

[ ] Set up off-site ground station for test monitoring and aircraft operations

[ ] Meet with industry partners to discuss test plan and make necessary changes

[ ] Provide assistance with payload construction and implementation while in the field

[ ] Operate off-site ground station for use with all KDLS flight operations

[ ] Monitor tests and maintain communications with KDLS on-site ground crew

[ ] Conduct additional tests as necessary to gather all pertinent flight test data

[ ] Archive test results as required using pre-defined lab file infrastructure

[ ] Send printer information (URL) to Chris Lum for approval

**Notes**

* User story intended to capture field work done by KDLS flight team during JCATI 2015 flight demonstration

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**1091 – JCATI 2015 KDLS Flight Demonstration (Copy 1)**

**Content**

See user story **Error! Reference source not found.** 2015 KDLS Flight Demonstration

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**1092 – JCATI 2015 KDLS Flight Demonstration (Copy 2)**

**Content**

See user story **Error! Reference source not found.** 2015 KDLS Flight Demonstration

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**1093 – JCATI 2015 KDLS Flight Demonstration (Copy 3)**

**Content**

See user story **Error! Reference source not found.** 2015 KDLS Flight Demonstration

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**1094 – Set Up Radio Communication**

**Content**

As a lab member, I would like to Research and set up a radio communication option for use when out of range of cell service.

**Definition of Done**

[x] Determine a feasible communication option

[x] Order necessary parts

[x] Install in MFOC

[x] Test

**Notes**

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**1095 – Create a System to Track Parts**

**Content**

As a lab member, I would like to create a system to track lab components.

**Definition of Done**

[x] Create a spreadsheet to track components

[x] Begin Process of labelling parts

**Notes**

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**1096 – Create a System to Track Member Certifications**

**Content**

As a lab member, I would like to create a system to track member certifications and to make sure each member has completed the safety training and other key indoc items.

**Definition of Done**

[x] Create a spreadsheet to track members, which should include:

* lab safety agreement
* contact info
* facebook like
* certifications and expirations

**Notes**

This does not mean that all the lab member info is up to date

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**1097 – Lab Cleaning and Reorganization**

**Content**

As a lab member, I would like to clean up the lab.

**Definition of Done**

[x] Reorganize boxes, and relabel

[x] Move things into deep storage

**Notes**

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**1098 – Create a Training Program for Simulator**

**Content**

As a lab flight operator, I would like to create a training program for the simulator

**Definition of Done**

[ ] Create a method to log flight time

[ ] Determine minimum sim time before actual flight time

[ ] Standardize which airframes/settings are acceptable

**Notes**

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**1099 – Start a Maintenance Manager Spreadsheet**

**Content**

As a lab lab member, I would like to create a maintenance manager spreadsheet

**Definition of Done**

[ ] Create a spreadsheet that tracks critical items such as autopilots, transmitter, etc and note when they need periodic service or maintenance

**Notes**

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**1100 – Register Argo**

**Content**

As a lab flight operator, I would like to register Argo with the FAA

**Definition of Done**

[ ] Register Argo to obtain an N number, ICAO address

**Notes**

Talk to Dr. Lum

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**1101 – Establish Emergency Procedures for Lost-Link, etc**

**Content**

As a lab member, I would like to establish emergency procedures for aircraft

**Definition of Done**

[ ] Establish emergency procedures for lost-link, flyaway, etc

[ ] Integrate into checklists

[ ] Conduct training for all operators

**Notes**

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**1102 – Add Python Interpreter on AFSLPrecision02**

**Content**

As a lab member, I would like to add Python Interpreter on AFSLPrecision02

**Definition of Done**

[ ] Add interpreter

**Notes**

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**1103 – Wind Tunnel Deep Storage (Copy 1)**

**Content**

See user story 1078 – Wind Tunnel Deep Storage

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**1104 – Wind Tunnel Deep Storage (Copy 2)**

**Content**

See user story 1078 – Wind Tunnel Deep Storage

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**1105 – October Flight Operations**

**Content**

As a flight ops director, I would like to do the tasks required for successful flight operations.

**Definition of Done**

[x] Prepare monthly COA report

[x] Tour new lab members

[x] Battery charging

[x] Get new members set up in lab

[x] Battery safety and storage

[x] Component tracking

[x] Website Info

[x] Cleaning

**Notes**

* Updated as necessary

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**1106 – 3D Printing TEDD’s Camera Housing**

**Content**

As a manufacturing engineer, I would like to model and manufacture a camera housing for the Cannon SLA camera to install on TEDD.

**Definition of Done**

[x] Measure necessary dimensions on TEDD’s camera cutout and SLA camera

[x] Model design in CAD program

[x] Document updates to CAD program

[x] Print the model

[x] Test functionality

[ ] Secure the model so it will not shift during a flight

**Notes**

* CAD file created on 10/1/16
* Measurements in mm
* 10/4/16 Printed model

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## 1107 – Mapping Administration

**Content**

As a project manager, I would like to perform several administrative tasks during sprint 1610 to ensure that all mapping work is progressing appropriately during this sprint.

**Definition of Done**

[ ] Lead weekly mapping meeting

[ ] Create user stories for mapping tasks

[ ] Ensure mapping team is making progress on tasks

[ ] Ensure completetion of tasks end of sprint

[ ] Write brief description of mapping in AFSLProjects document

**Notes**

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**1108 – AIAA Conference Paper Draft Writing**

**Content**

As a student, I would like to summarize my research in a conference paper submission while working on relevant sections of my thesis so I can graduate

**Definition of Done**

[ ] Write relevant sections of thesis to be added to conference paper

[ ] Ensure conference submission draft is completed by 17 October

[ ] Ensure conference paper is submitted prior to the deadline of 24 October

**Notes**

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## 1109 – JCATI To-Do Items

**Content**

As a lab member, I need to prepare for the upcoming SDR flight and ground tests for the JCATI project.

**Definition of Done**

[ ] Determine the exact frequency of primary c2 transmitter

[ ] Obtain an Ethernet cable for the connection between GCS to GSN

[ ] Generate a master project vision document

[ ]Outline hardware components

[ ]Identify all wireless links: primary transmitter, 3dr radio, wifi, bladeRF, fpv, etc.

[ ]Identify nomenclature an dnames for all components and actors

[ ] Research picksi RTK

[ ] Update flight test cards

[ ] Different altititudes

[ ] Tripod on top of trailer

[ ] Update MARV AFM

[ ] Marco Polo tracker and arm/disarm procedure

[ ] Create ARGO AFM

[ ] Edit Noshad’s Document

[ ] ARGO indoor flight test

**Notes**

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## 1110 – JCATI To-Do Items (Copy)

**Content**

As a lab member, I need to prepare for the upcoming SDR flight and ground tests for the JCATI project.

**Definition of Done**

[ x] Determine the exact frequency of primary c2 transmitter

[ x] Obtain an Ethernet cable for the connection between GCS to GSN

[ ]x Generate a master project vision document

[x ]Outline hardware components

[ x]Identify all wireless links: primary transmitter, 3dr radio, wifi, bladeRF, fpv, etc.

[ x]Identify nomenclature an dnames for all components and actors

[ x] Update flight test cards

[ x] Different altititudes

[ x] Tripod on top of trailer

[ ] Update MARV AFM

[ ] Marco Polo tracker and arm/disarm procedure

[ x] Create ARGO AFM

[x ] Edit Noshad’s Document

[ ] ARGO indoor flight test

**Notes**

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## 1111 – ARGO Repair

**Content**

As a lab member, I need to diagnose the ARGO system failure and guarantee its airworthiness.

**Definition of Done**

[x ] Determine the cause of the system failure

[ x] Determine the extent of damage to the electrical system

[ x] Order and repair the fried connectors

**Notes**

The previously used battery had an inadequate discharge rating and was overdrawn when the props spun.

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## 1112 – ARGO Repair (Copy)

**Content**

As a lab member, I need to diagnose the ARGO system failure and guarantee its airworthiness.

**Definition of Done**

[ ] Determine the cause of the system failure

[ ] Determine the extent of damage to the electrical system

[ ] Order and repair the fried connectors

**Notes**

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## 1113 – Piksi RTK Flight Test (Abbreviated)

**Content**

As a lab member, I would like to work on setting up the Piksi real time kinematics location system and determine its feasibility for use with the JCATI Project.

**Definition of Done**

[ x] Locate documentation and become familiar with it

[ x] Perform ground tests

[ ] Complete 3d printed mounts and ground plates to minimize interference

[ ] Set up mission planner to accept piksi data

~~[ ] Complete a flight test~~

**Notes**

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## 1114 – MFOC Maintenance (part 1)

**Content**

As a lab member, I would like to work on the MFOC maintenance To-Do list

**Definition of Done**

[ ] Address MFOC maintenance to-do items

**Notes**

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## 1115 – CERES Hand Launch

**Content**

As a lab member, I would like to install handle bars beneath CERES to test the feasibility of hand launching Skywalker X8s.

**Definition of Done**

[ ] Install two handle bars beneath CERES

[ ] Ensure secure connection

[ ] Test the launching system on Rainier Vista

[ ] Obtain video footage of test launch

[ ] Launch CERES on the 10/29 excursion

**Notes**

See vidoes for proof of concept

a.       <https://www.youtube.com/watch?v=FopQaOeZvVY&feature=youtu.be>

b.      <https://www.youtube.com/watch?v=RWNp59af4NA&feature=youtu.be>

c.       <https://www.youtube.com/watch?v=KBIVaecTXgA&feature=youtu.be>

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## 1116 – Canon EOS and Canon Vixia Optical Settings

**Content**

As a mapping researcher, I would like to research and apply the most optimal settings on the Canon EOS and Canon Vixia to obtain clear photos and video footage

**Definition of Done**

[ ] TBD

**Notes**

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## 1117 – Mapping Software Research

**Content**

As a lab member, I would like to research different softwares that can be used to analyze mapping data.

**Definition of Done**

[ ] TBD

**Notes**

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## 1118 – Poaching Operations Research

**Content**

TBD

**Definition of Done**

[ ] TBD

**Notes**

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## 1119 – SLA-1500 Wireless Connection

**Content**

TBD

**Definition of Done**

[ ] TBD

**Notes**

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## 1120 – Falco Pixhawk Assembly (copy 1)

**Content**

As a lab member, I would like to integrate the Pixhawk and its electronic components into Falco.

**Definition of Done**

[ ] Integrate Pixhawk, GPS, power module, I2C bus, airspeed sensor, RC Reciever and telemetry radio.

[ ] Ensure that all connections and components are secured with velcro if necessary.   
[ ] Ensure Falco is connects to a transmitter and test control surfaces and throttle

[ ] Research parameters for Falco and write them to Pixhawk

**Notes**

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## 1121 – Falco Pixhawk Assembly (copy 2)

**Content**

As a lab member, I would like to integrate the Pixhawk and its electronic components into Falco.

**Definition of Done**

[ ] Integrate Pixhawk, GPS, power module, I2C bus, airspeed sensor, RC Reciever and telemetry radio.

[ ] Ensure that all connections and components are secured with velcro if necessary.   
[ ] Ensure Falco is connects to a transmitter and test control surfaces and throttle

[ ] Research parameters for Falco and write them to Pixhawk

**Notes**

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## 1122 – Falco Pixhawk Assembly (copy 3)

**Content**

As a lab member, I would like to integrate the Pixhawk and its electronic components into Falco.

**Definition of Done**

[ ] Integrate Pixhawk, GPS, power module, I2C bus, airspeed sensor, RC Reciever and telemetry radio.

[ ] Ensure that all connections and components are secured with velcro if necessary.   
[ ] Ensure Falco is connects to a transmitter and test control surfaces and throttle

[ ] Research parameters for Falco and write them to Pixhawk

**Notes**

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## 1123 – Trailer Tidying and Poster Hanging

**Content**

As a lab member, I would like to help organize the MFOC and Hang the sponsor poster in the lab space.

**Definition of Done**

[x] Remove non-essential equipment from trailer to deep storage in the wind tunnel.

[x] Hang sponsor poster in the lab with thumb tacks.

**Notes**

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## 1124 – Register Falco with FAA

**Content**

As a lab flight operator, I would like to register Falco with the FAA

**Definition of Done**

[ ] Register Falco to obtain an N number, ICAO address

**Notes**

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## 1125 – Request a Waiver for sUAS – Increase in Altitude

**Content**

As a lab flight operator, I would like to request a waiver for sUAS with the FAA so that I can increase the flight ceiling in Meadowbrook to 650 feet.

**Definition of Done**

[X] Coordinate with Chris Lum before starting this user story.

[ ] Read the form instructions (\FlightOperations\Research\FAA\instructions.pdf) and  the [list of regulations subject to waiver](https://www.faa.gov/uas/beyond_the_basics/#waiver) prior to filling the online form.

[ ] Filling the online form that is located at <https://www.faa.gov/uas/request_waiver/>.

[ ] Discuss the drafted form with lab members before submitting.

[ ] Submit the revised form.

**Notes**

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## 1126 – Request a Waiver for sUAS – Increase in Altitude (Copy)

**Content**

As a lab flight operator, I would like to request a waiver for sUAS with the FAA so that I can increase the flight ceiling in Meadowbrook to 650 feet.

**Definition of Done**

[X] Coordinate with Chris Lum before starting this user story.

[ ] Read the form instructions (\FlightOperations\Research\FAA\instructions.pdf) and  the [list of regulations subject to waiver](https://www.faa.gov/uas/beyond_the_basics/#waiver) prior to filling the online form.

[ ] Filling the online form that is located at <https://www.faa.gov/uas/request_waiver/>.

[ ] Discuss the drafted form with lab members before submitting.

[ ] Submit the revised form.

**Notes**

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## 1127 – Flight Training Program

**Content**

As a future sUAS pilot, I would like to complete the AFSL required training to become eligible to fly the lab’s aircraft.

**\*\*Flight training must be taken seriously. At some point you could be asked to safely takeoff, fly and land a $10,000 sensor in less than ideal weather, so you need to be ready to meet this challenge whenever it arises\*\***

**Definition of Done**

[ ] Before anything else, read the training information located here: **\FlightOperations\Operators\Training\FlightTrainingInformation.docx**.

[ ] Read through and understand the Airworthiness Directives located: **\FlightOperations\Operations\AFSLFlightOperations\AFSLFlightOperationsManual.docx**

[ ] Log at least three hours of *productive* simulator time on PhoenixRC on the computer nearest the door. Please use the **Multiplex EasyStar AFSL\_Skywalker\_Trainer** model (listed under the favorites – this is important because the version that doesn’t say AFSL\_Skywalker\_Trainer does not have ailerons). Additional time may be spent on other airframes, but a minimum three hours on the EasyStar are required. This includes the following:

[x] Log at least three hours here in the gray section of this document: **\FlightOperations\Operators\Training\FlightTrainingRecords.xlsx**

[x] Practice flying a basic traffic pattern

[x] Practice reverse orientation flying

[x] Perform 15 safe landings on a Dead Calm day (weather can be adjusted in the settings)

[x] Perform 15 safe landings on a Brisk day

[x] Perform 15 safe landings on a Fair Wind day

[ ] Demonstrate to a lead pilot proficiency on takeoff, cruise, reverse orientation and landing

[ ] Fly Anakin with buddy box system in the field and complete or show proficiency in the following:

[ ] Three successful takeoffs

[ ] Reverse orientation

[ ] Cruise in manual mode

[ ] Cruise in stabilize mode

[ ] RTL mode

[ ] Three successful landings

[ ] Log all time here in the blue section: **\FlightOperations\Operators\Training\FlightTrainingRecords.xlsx**

[ ] Receive approval for fixed wing solo flight

**Notes**

* Rotor flight will require rotor specific training

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## 1128 – MFOC Maintenance (copy)

**Content**

See user story 1114 – MFOC Maintenance

**Notes**

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## 1129 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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**1130 – FPV Camera for TEDD**

**Content**

As a lab researcher, I would like to research and install a FPV camera on TEDD.

**Definition of Done**

[ ]Research the FPV camera, setup and system in a sUAV  
[ ]Create a list of items for procurement  
[ ]Install FPV camera on TEDD  
[ ]Test camera during a flight test

**Notes**

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**1131 – MOFC 3D Printing**

**Content**

As a lab researcher, I would like to reprint the MFOC hole cover to be able to route wires through the hole without removing the cover.

**Definition of Done**

[ ] Edit the Solidworks model to have a cable access.

[ ] Print model.

[ ] Outfit model with weatherstripping.

**Notes**

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**1132 – SLA-1500 Gimbal Research**

**Content**

As a lab researcher, I would like to research the feasibility of installing the SLA-1500 camera onto a 3 axis rotation gimbal.

**Definition of Done**

TBD

**Notes**

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## 1133 – Perforce Visual Client (copy)

**Content**

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**Definition of Done**

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**Notes**

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## 1134 – Part 107 Test Preparation (Copy)

**Content**

* See 1055 – Part 107 Test Preparation

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## 1135 – GROVER Maintenance

**Content**

As a lab member, I need to fix GROVER for ‘flight-ready’ capability

**Definition of Done**

[ ] Determine the cause of the FPV gimbal not responding correctly

[ ] Fix or replace broken servos / Fix Transmitter or Pixhawk settings

[ ] Document Fixes at

\FlightOperations\UAS\GROVER\ConstructionAndMaintenenceLog.docx

**Notes**

**This UserStory will be an ongoing event to cover GROVER issues**

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## 1136 – Perforce Visual Client (copy)

**Content**

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**Definition of Done**

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**Notes**

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## 1137 – Perforce Visual Client (copy)

**Content**

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**Definition of Done**

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## 1138 – Perforce Visual Client (copy)

**Content**

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**Definition of Done**

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## 1139 – Perforce Visual Client (copy)

**Content**

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**Definition of Done**

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## 1140 – Perforce Visual Client (copy)

**Content**

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**Definition of Done**

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## 1141 – Perforce Visual Client (copy)

**Content**

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**Definition of Done**

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## 1142 – Perforce Visual Client (copy)

**Content**

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**Definition of Done**

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## 1143 – Perforce Visual Client (copy)

**Content**

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**Definition of Done**

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## 1144 – Perforce Visual Client (copy)

**Content**

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**Definition of Done**

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## 1145 – Perforce Visual Client (copy)

**Content**

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**Definition of Done**

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## 1146 – Perforce Visual Client (copy)

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## 1147 – Perforce Visual Client (copy)

**Content**

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## 1148 – Perforce Visual Client (copy)

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**Definition of Done**

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**Notes**

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## 1149 – Creating an Angled Platform for Object Detection

**Content**

As a member of the Mapping team, I would like to create an angled platform on the trailer for us to detect data when we do test flights at different angles. This would give us a wider range of data when we do volumetric analysis for objection detection.

**Definition of Done**

[ ] Find if any similar systems to the proposed product is currently in use

[ ] Create an platform that can vary from 30-60-90 degrees.

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## 1150 – Volumetric Analysis

**Content**

As a member of the Mapping team, I would like to create an experiment and do analysis on the data collected during test flights. I want to be able to do volumetric analysis in order to see if the objects detected using Micasense can tell us what kind of object and how much volume the aerial data (DSM) will show us. I want to accomplish this through Matlab.

**Definition of Done**

[ ] Convert Tif files to Grd files

[ ] Work on Matlab script

[ ] Figure out what parameters are needed

[ ] Collect data from the flight testing of objects at varying degrees

[ ] Design the experiment

**1151 – Investiagation of Mission Planner’s swarm capabilities**

**Content**

As a lab researcher, I would like to research, summarize, and present the Capability of Mission Planner and other Software for Swarm control.

**Definition of Done**

 [ ] Investigate whether Mission Planner can control a swarm of multiple UAVs

        [ ] How would this work?

        [ ] Would the aircraft be able to operate individually or would they follow the same flight paths?

[ ] Investigate the details of using Mission Planner to control multiple UAVs

        [ ] How would we create flight paths for aircraft?

        [ ] Could we still use the standard 915 MHz telemetry?

        [ ] How reliable would this be?

        [ ] Would any programming be required?

[ ] Investigate alternative software for swarm control

        [ ] Investigate and record the details of alternative software

[ ] How does swarm operation fit into Part 107 regulations?

[ ] Compile and summarize all information into a presentation detailing answers to the above questions

         [ ] Presentation should include a comparison of other 'Swarm-control' software and Mission Planner

[ ] Discuss findings with Zach, Connor, and Dr. Lum

[ ] Present results to the group at the research meeting

**Notes**

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**1152 – Write SAM Aircraft Flight Manual**

**Content**

As a lab member, I would like to write the AFM for SAM.

**Definition of Done**

[ ] Write a complete AFM for the new plane

**Notes**

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**1153 – Airworthiness for SAM**

**Content**

As a lab member, I would like to make sure that the new plane, SAM, is airworthy and ready to fly.

**Definition of Done**

[ ] Become familiar with pre-installed hardware on SAM

[ ] Determine what it will take to make sure it is compatible to fly with our current systems

[ ] Do what it takes to get SAM ready for a flight test, which could include:

* Check all current systems

[ ] Talk to Dr. Lum about getting it registered with the FAA

[ ] Write a test card for initial flight test

[ ] Brainstorm ideas for how AFSL can best use this airframe, primarily for mapping

**Notes**

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**1154 – AIAA Conference Paper Draft Writing (copy)**

**Content**

As a student, I would like to summarize my research in a conference paper submission while working on relevant sections of my thesis so I can graduate

**Definition of Done**

[ ] Write relevant sections of thesis to be added to conference paper

[ ] Ensure conference submission draft is completed by 17 October

[ ] Ensure conference paper is submitted prior to the deadline of 24 October

**Notes**

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**1155 – AIAA Conference Paper Draft Writing (copy)**

**Content**

As a student, I would like to summarize my research in a conference paper submission while working on relevant sections of my thesis so I can graduate

**Definition of Done**

[ ] Write relevant sections of thesis to be added to conference paper

[ ] Ensure conference submission draft is completed by 17 October

[ ] Ensure conference paper is submitted prior to the deadline of 24 October

**Notes**

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**1156 – ARGO Gimbal Construction**

**Content**

As a lab member, I’d like to construct the gimbal meant for ARGO and calibrate it.

**Definition of Done**

[x ] Construct the frame and attach motors

[ ] Determine the correct software to use for interfacing with the control board

[ ] Calibrate the control board

[ ] Integrate with the pixhawk so that the pilot is able to control it with the primary or a secondary transmitter

**Notes**

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**1157 – Invesitage LIDAR Feasiblity**

**Content**

As a lab member, I would like to look into using lidar as a possible mapping payload for ARGO

**Definition of Done**

[X] Look into the precedence of using Lidar on small UAV systems

[X] Research possible applications of this technology

[X] Discuss your findings with Dr. Lum, Connor, Zach and Scott

**Notes**

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**1158 – ARGO Interchangeable Payload Mount**

**Content**

As a lab member, I want to design and construct a mount that would be able to accept multiple payloads.

**Definition of Done**

[ ] Design a tray that could securely hold the bladeRF during flight tests

[ ] Design a tray that would allow the gimbal to use the mount

[ ] Ensure that the mount would allow for payloads to be quickly swapped using quick releases

[ ] Construct the trays

[ ] Construct the mount and attach it to ARGO

[ ] Make sure that adequate documentation is added to perforce

**Notes**

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**1159 – Additional Multi-Rotor research**

**Content**

As a lab member, I would like to research additional multi rotor frames for use in a swarm

**Definition of Done**

[ ] Research different types of multi-rotor frames

[ ] Build from scratch or buy an assembled kit?

[ ] How many rotors? What size should it be?

[ ] The multi rotor should be versatile and able to be used with multiple projects

[ ] Determine what flight characteristics are required for multi rotors in a swarm

[ ] Present your findings to Dr. Lum and the multi rotor team

**Notes**

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**1160 – Props for Flight Tests**

**Content**

As a lab member, I would like to research and procure props for Vulcan flight tests.

**Definition of Done**

[ ] Research poaching tactics, and accessories

[ ] Determine what props would be valuable to have for our flight tests to accurately simulate a poaching environment

[ ] Find where these items can be procured from and obtain them

[ ] Talk to Dr. Lum about budgeting

**Notes**

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**1161 – Vulcan Test Matrix**

**Content**

As a lab member, I would like to develop a test matrix for tests to run for detecting poachers for the upcoming flight tests.

**Definition of Done**

[ ] Based on poaching tactics, determine the parameters that can be changed to set up a test plan for using Vulcan’s camera

[ ] Write test cards based on these parameters

**Notes**

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**1162 – Airworthiness for SAM (copy)**

**Content**

Copy of user story 1153 – Airworthiness for SAM

**Definition of Done**

Copy definition from user story 1153 – Airworthiness for SAM

**Notes**

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**1163 – Flight Ops Administration (11/2016)**

**Content**

As flight operations director, I would like to complete the following tasks to administrate flight operations.

**Definition of Done**

[ ] Update Talon AFM

[ ] Organize training flights

[ ] Ben airworthiness

[ ] Check over Vulcan contract

[ ] Oversee altitude waiver

[ ] Oversee Argo tent test

**Notes**

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## 1164 – Arduino with Matlab and Simulink (Position 3)

See ‘1022 – Arduino with Matlab and Simulink’

## 1165 – Arduino with Matlab and Simulink (Update Documentation) (Position 3)

1023 – Arduino with Matlab and Simulink (Update Documentation)

**1166 – Luke Post-Mortem Analysis**

**Content**

As lab member, I would like to conduct a Luke post-mortem analysis to determine what the cause of failure was.

**Definition of Done**

[ ] Systematically determine what went wrong

[ ] Investigate each part to see if it is working properly

* + be sure to mark broken ones on inventory log: \FlightOperations\UAS\ComponentTracker.xlsx

[ ] Investigate the data logs for clues

[ ] Release back into circulation any components that are working and undamaged

[ ] Report to stakeholders of findings so crash isn’t repeated

**Notes**

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**1167 – Arduplane SITL Validation**

**Content**

As a lab member, I would like to test the UW custom arduplane by doing a SITL test in mission planner.

**Definition of Done**

[] Install all necessary software to complete test

[] Make sure custom arduplane code is running properly in SITL test

[] Make sure UW mode 2 (SITL Visual Anchoring Mode) is working properly in SITL test

**Notes**

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**1168 – CONDOR Post-Mortem Analysis**

**Content**

As lab member, I would like to conduct a CONDOR post-mortem analysis to determine what the cause of failure was.

**Definition of Done**

[ ] Systematically determine what went wrong

[ ] Investigate each part to see if it is working properly

* + be sure to mark broken ones on inventory log: \FlightOperations\UAS\ComponentTracker.xlsx

[ ] Investigate the data logs for clues

[ ] Release back into circulation any components that are working and undamaged

[ ] Report to stakeholders of findings so crash isn’t repeated

**Notes**

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**1169 – Understand Image Processing Matlab Code**

**Content**

As lab member, I would like to go through the Image Processing matlab code on perfoce and try to understand/document how the algorithm works.

**Definition of Done**

[] Understand the image processing algorithm that take inputs of images and outputs slant range to target on image

[] Help document code to help others understand the process

**Notes**

**1170 – FPV Camera Research for Skywalker X8**

**Content**

As lab member, I would like to research the variety of FPV cameras that we can use on a Skywalker X8.

**Definition of Done**

TBD

**Notes**

## 1171 – New AFSL Printer (copy)

**Content**

As a lab member, I would like to research and procure a new printer for the lab

**Definition of Done**

[x] Search for a laser black printer online with Ethernet interface

[x] Send printer information (URL) to Chris Lum for approval and purchase

[x] Set up printer with all lab desktops, including getting a static IP address from UW IT.

[x] Add printer documentation and instructions to Perforce

**Notes**

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**1172 – AIAA Conference Paper Draft Writing (copy)**

**Content**

As a student, I would like to summarize my research in a conference paper submission while working on relevant sections of my thesis so I can graduate

**Definition of Done**

[ ] Write relevant sections of thesis to be added to conference paper

[ ] Ensure conference submission draft is completed by 17 October

[ ] Ensure conference paper is submitted prior to the deadline of 24 October

**Notes**

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**1173 – AIAA Conference Paper Draft Writing (copy)**

**Content**

As a student, I would like to summarize my research in a conference paper submission while working on relevant sections of my thesis so I can graduate

**Definition of Done**

[ ] Write relevant sections of thesis to be added to conference paper

[ ] Ensure conference submission draft is completed by 17 October

[ ] Ensure conference paper is submitted prior to the deadline of 24 October

**Notes**

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**1174 – AIAA Conference Paper Draft Writing (copy)**

**Content**

As a student, I would like to summarize my research in a conference paper submission while working on relevant sections of my thesis so I can graduate

**Definition of Done**

[ ] Write relevant sections of thesis to be added to conference paper

[ ] Ensure conference submission draft is completed by 17 October

[ ] Ensure conference paper is submitted prior to the deadline of 24 October

**Notes**

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**1175 – AIAA SciTech Conference Paper Draft Writing**

**Content**

As a student, I would like to summarize my research in a conference paper submission while working on relevant sections of my thesis so I can graduate

**Definition of Done**

[ ] Write relevant sections of thesis to be added to conference paper

[ ] Ensure mathematical modeling for estimators is sound within flight tracking context

[ ] Ensure draft is completed before the end of autumn quarter 2016 (9 Dec 2016)

**Notes**

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**1176 – Flight Training Program**

**Content**

Copy of user story **Error! Reference source not found.**t Training Program

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.** Training Program

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**1177 – Image Processing 1: slant range algorithm**

**Content**

As a developer and researcher in working on Visual Anchoring project, I’d like to develop and test a computer vision algorithm that can calculate the slant range between each pixel to camera.

**Definition of Done**

[X] Research online and look for approaches

[X] Evaluate the plausible approaches

* Using Triangle Similarity
* Using Camera Intrinsic Matrix

[X] Write up/ construct the mathematical model

[X] Test the algorithm with test pictures

[X] Document the model for record and future reference

**Note**

This is the part 1 of a (currently) 4-part series image processing application project. Image processing application is part of the Visual Anchoring project.

**Finish Note:**

Since the actual size of our target is often inacquirable in our applications,

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**1178 – Image Processing 2: fit slant range algorithm to tracking algorithm**

**Content**

As a developer and researcher in working on Visual Anchoring project, I’d like to put developed algorithm that calculates slant range in the object following code, so that the algorithm can calculate slant range in real time while tracking the target.

**Definition of Done**

[ ] Revisit object following code, discover where the code can be best plugged in

[ ] Revise slant range code accordingly to fit into object following code

[ ] Test the new object following algorithm on test footage

**Note**

This is the part 2 of a (currently) 4-part series image processing application project. Image processing application is part of the Visual Anchoring project.

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**1179 – Image Processing 3: automate the algorithm**

**Content**

As a developer and researcher in working on Visual Anchoring project, I’d like to research whether there’s a way to automatically start the algorithm and track the target.

**Definition of Done**

[ ] Research on the possibility to automate the algorithm

* For example, first take a picture of the target, then add a feature matching algorithm to existing code. When the feature matching algorithm is triggered, the tracking algorithm is waken up and starts operate.
* The benefit is that the operator don’t need to manually select the object to track in operation time.

[ ] Develop a possible model for it

[ ] Test the modified algorithm with test footage

**Note**

This is the part 3 of a (currently) 4-part series image processing application project. Image processing application is part of the Visual Anchoring project.

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**1180 – Image Processing 4: field test & finalize**

**Content**

As a developer and researcher in working on Visual Anchoring project, I’d like to conduct a field test on the capability of the improved object following algorithms.

**Definition of Done**

[ ] Discuss with Prof. Lum on arranging a field test for the algorithm

[ ] Conduct the test

[ ] Write a report on the test result

[ ] Modify/improve the algorithm base on the test feedback

**Requirements for the Final Result**

[ ] The image processing system shall consume live video imagery from the aircraft and compute the slant range at a rate of 1Hz or better.

[ ] The slant range measurements shall be 15% accurate.

[ ] The system shall be implemented on the AFSL\_CONDOR computer.

[ ] The image processing system shall be tested in a minimum of least 2 live flight tests.

[ ] The system shall be demonstrable using pre-recorded video footage as input.

**Note**

This is the part 4 of a (currently) 4-part series image processing application project. Image processing application is part of the Visual Anchoring project.

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**1181 – Flight Training Program**

**Content**

Copy of user story **Error! Reference source not found.**t Training Program

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.** Training Program

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**1182 – Maintenance of Training Planes (Position 1)**

**Content**

As a flight operations member, I would like to check the airworthiness of planes used for training.

**Definition of Done**

**For DubCub and Ben**

[x] Ensure structural soundness of each plane

[x] checked if each component needing replacing

[x] Inventory parts

[x] Bind to a receiver

**Note**

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**1183 – Maintenance of Training Planes (Position 2)**

**Content**

Copy of user story 1182 – Maintenance of Training Planes (Position 1)

**Definition of Done**

Copy of user story 1182 – Maintenance of Training Planes (Position 1)

**Note**

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## 1184 – Turnigy Talon Tricopter (T3) Build

**Content**

As a UAS operator, I would like to build the Turnigy Talon Tricopter (T3) so I can use it for demonstration purposes as well as research and testing.

**Definition of Done**

[ ] Coordinate with Chris Lum before starting this story

[ ] Coordinate with Yifu before starting this story.

[ ] Build the Turnigy Talon Tricopter and make it airworthy. Some subsystem to consider include but are not limited to:

[ ] ESC

[ ] Battery switches

[ ] Pixhawk mini

[ ] Video Tx

[ ] Camera

[ ] Review final product with Chris Lum.

[ ] Come up with a name for the system

[ ] Document all construction in appropriate location.

[ ] Present results to research group.

[ ] Conduct flight tests.

[ ] Additional tasks TBD

**Notes**

* See build notes for MARV.

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## 1185 – Request a Waiver for sUAS – Increase in Altitude (copy)

**Content**

As a lab flight operator, I would like to request a waiver for sUAS with the FAA so that I can increase the flight ceiling in Meadowbrook to 650 feet.

**Definition of Done**

[x] Coordinate with Chris Lum before starting this user story.

[x] Read the form instructions (\FlightOperations\Research\FAA\instructions.pdf) and  the [list of regulations subject to waiver](https://www.faa.gov/uas/beyond_the_basics/#waiver) prior to filling the online form.

[x] Filling the online form that is located at <https://www.faa.gov/uas/request_waiver/>.

[x] Discuss the drafted form with lab members before submitting.

[x] Submit the revised form.

**Notes**

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## 1186 – HiLPixhawk Maintenance

**Content**

As a researcher, I would like to prepare HiLPixhawk1 to be airworthy.

**Definition of Done**

[X] Coordinate with Chris Lum before starting this user story.

[x] Load ArduCopter firmware

[x] Calibrate Accelerometer and GPS

[x] Test if Dataflash logs and telemetry logs can be recorded

[ ] Inventory the parts

**Notes**

* Dataflash logs cannot be recorded despite loading MARV parameters and changing the specific logging parameters in Mission Planner

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## 1187 – Visual Anchoring White Paper

**Content**

As a researcher, I would like to develop a white paper for the visual anchoring project in order to get funding for future research.

**Definition of Done**

[] Use the example white paper to create a draft for the visual anchoring project through March 2018

[] Submit draft to Dr. Lum and revise as necessary

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## 1188 – Understand Original Image Processing Algorithm

**Content**

As a researcher developing an improved version of image processing project, I would like to have a deep grasp of the original image processing algorithm and figure out how to best induce changes

**Definition of Done**

[X] Throughly read and understand the image processing algorithm on Conference Paper

[X] Throughly read the code and understand where needs to change and where can remain unchanged

[X] Discuss with other collaborators to figure out unclear parts

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## 1189 – Integrate Tracking and Image Processing Algorithms

**Content**

As a researcher, I would like to integrate the image tracking and image processing algorithms that track objects and find the slant ranges of targets in the image frame respectively.

**Definition of Done**

[] Verify that image tracking code properly works

[] Verify that slant range image processing code properly works

[] Verify that the both codes work after integration with similar tests

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## 1190 – Custom Arduplane build with UW modes

**Content**

As a researcher, I would like to make a custom build of Arduplane with UW modes 1-4. I would also like to validate the orbit controllers used in the UW modes.

**Definition of Done**

[] Verify that the orbit controllers work properly in SITL

[] Verify that the orbit controllers work properly by testing with image processing algorithms

[] Make a custom build of Arduplane to upload to Rebuilt CONDOR for ground testing

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## 1191 – Prepare Rebuilt CONDOR for ground testing

**Content**

As a researcher, I would like to finish rebuilding CONDOR and prepare it for ground testing.

**Definition of Done**

[] Work with Mike Brady to finish the rebuild of CONDOR

## 1192 – Mission Planner Familiarization (copy)

**Content**

Copy of user story 1083 – Mission Planner Familiarization

As a lab member, I would like to learn how to use Mission Planner.

**Definition of Done**

[ ] Familiarize with Mission Planner user interface and utilization

http://ardupilot.org/planner/docs/mission-planner-overview.html

\\FlightOperations\UAS\CommonDocuments\MissionPlanner\ OperationalChecklistsAndNotes.docx

[ ] Download Mission Planner

[ ] Load a TLog and a Waypoints file from a previous flight for reference

[ ] Successfully Connect to a vehicle via wired and wireless connection

[ ] Create a Waypoints file and test/verify before a flight test or with a senior member

[ ] Familiarize/Perform typical preflight calibrations with help from a senior member

[ ] Airspeed Sensor Calibration

[ ] Radio Transmitter Calibration

[ ] Accelerometer Calibration

[ ] Observe / Practice Data Technician procedures during Flight dates

[ ] Observe / Practice GCS operation / communication procedures during Flight dates

[ ] Familiarize with spotting and fixing errors in Mission Planner

[ ] Create and test a python script

**Notes**

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## 1193 – ARGO “Training Wheels”

**Content**

As a lab member, I would like to build a mechanism to increase the safety of Argo landings.

**Definition of Done**

[ ] Design a “training wheels” platform for Argo (ex PVC pipe)

[ ] Determine the necessary materials

[ ] Build platform

[ ] Test in flight

**Notes**

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## 1194 – Soldering

**Content**

As a lab member, I would like to solder a battery and telemetry wire for SAM.

**Definition of Done**

[x] Solder battery

[ ] Solder wires to increase length

**Notes**

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## 1195 – LinkedIn Page Setup and Facebook Link

**Content**

As a lab member, I would like to create a LinkedIn Page for the AFSL and link it to the AFSL Facebook Page.

**Definition of Done**

[ ] Create a test LinkedIn Page to see how the features work

[ ] Link the test LinkedIn Page to a test Facebook page

[ ] Contact Dr. Lum to discuss research results

[ ] Given Dr. Lum’s permission, set up the real LinkedIn Page for the AFSL lab

[ ] Link the Facebook Page to the AFSL lab

[ ] Post on Facebook Page that the AFSL lab has a LinkedIn Account

**Notes**

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## 1196 – GROVER Research – Mission Planner and Python Scripts

**Content**

As a lab member, I will begin looking at using Mission Planner to communicate GPS coordinates between a UAV and GROVER.

**Definition of Done**

[ ] Be able to load and run python scripts on Mission Planner

[ ] Inform Zach about result of scripts

[ ] Discuss next steps with Zach

**Notes**

While using Mission Planner is the ideal way to communicate GPS coordinates between GROVER and a UAV, there might be alternate ways to do this. In addition, research into how many computers are needed to communicate these coordinates are also part of this story.

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**1197 – Master’s Thesis Rough Draft (Larson)**

**Content**

As a student, I would like to write my Master’s thesis so I can graduate.

**Definition of Done**

[ ] Write rough draft of Master’s thesis

**Notes**

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**1198 – Master’s Thesis Revisions (Larson)**

**Content**

As a student, I would like to write my Master’s thesis so I can graduate.

**Definition of Done**

[ ] Revise thesis rough draft per comments from committee members.

**Notes**

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**1199 – Master’s Thesis Presentation (Larson)**

**Content**

As a student, I would like to write my Master’s thesis so I can graduate.

**Definition of Done**

[ ] Polish thesis as necessary

[ ] Present thesis results at department wide meeting/presentation on (date TBD)

[ ] Obtain all necessary signatures and documents required for graduation

**Notes**

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**1200 – Master’s Thesis Polishing (Larson)**

**Content**

As a student, I would like to write my Master’s thesis so I can graduate.

**Definition of Done**

[ ] Revise thesis rough draft per comments from committee members.

[ ] Clean up figures, double check calculations, verify correct citations, etc.

**Notes**

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**1201 – Flight Training Program**

**Content**

Copy of user story **Error! Reference source not found.**t Training Program

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.** Training Program

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## 1202 – Flight Instruction

**Content**

As a remote pilot, I would like to train others to fly the fixed wing aircraft in the lab.

**Definition of Done**

[x] Do what it takes to comfortably approve others for solo flight operations in the lab

**Notes**

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## 1203 – MFOC Maintenance (part 2)

**Content**

As a lab member, I would like to work on the MFOC maintenance To-Do list

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

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## 1204 – Student Technology Fee Proposal (copy) – LIDAR

**Content**

Copy of user story 479 – Student Technology Fee Proposal

As a project manager, I would like to submit a proposal to the UW Student Technology Fee to see if we can obtain funding for some of our purchases.

**Definition of Done**

[x] Coordinate with Chris Lum before starting this story.

[x] Read about the STF proposal process at <https://techfee.washington.edu/>

[x] Read past successful proposals in related areas. Two from David Shean are

[x] <https://techfee.washington.edu/proposals/2013-079/>

[x] <https://techfee.washington.edu/proposals/2014-059/>

[x] Coordinate with Eleanor Forbes and get her advice on successful proposals to the STF.

[x] Add additional tasks to this user story as appropriate (for example obtaining relevant student testimonials and department support)

[x] Ensure that deadline for the proposal is being tracked by Chris Lum

[x] Create a list of equipment to ask for and create an appropriate budget.

[x] Obtain signatures

[x] Author

[x] Main Contact

[x] Budget Contact

[x] Dean Contact

[x] Create proposal and get this reviewed with Hannah and Chris.

[x] Submit the proposal.

**Definition of Done**

Copy definition of done from user story 479 – Student Technology Fee Proposal

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## 1205 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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**1206 – Flight Ops Administration (12/2016)**

**Content**

As flight operations director, I would like to complete the following tasks to administrate flight operations.

**Definition of Done**

[ ] Coordinate and administrate flight tests

**Notes**

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## 1207 – AFSL Website Updates (People Section) (copy)

**Content**

Copy of user story 495 – AFSL Website Updates (People Section)

As a marketing agent, I would like to update the AFSL website “People” section with new information so I can publicize our activities.

**Definition of Done**

[x] Coordinate with Chris Lum before starting this user story.

[ ] Update the “People” section

[x] Wipe all student researchers

[x] Keep Directors and Affiliate Directors

[x] Obtain photos and short bios of all active members

[x] Remove all inactive members to past researchers section

[x] Determine where old members are now and update/highlight success stories

[x] Capitalize design, build, fly in Chris Lum description

[x] Take out spacing between email and phone number under Directors

[x] Check with Chris Lum if we need to include Sponsors and special thanks (e.g. recent UAV donation)

[x] Review all materials with Chris Lum

[x] Gain student editing access from Kevin Ward

[x] Ensure that changes are made and correct on the final website.

[x] When the user story is coming to 100% completion, please make a new copy of this userstory for the next quarter/year.

**Notes**

* All website material is located in [\\AFSL\WebsiteInfo](file:///\\AFSL\WebsiteInfo)
* Coordinate with development champion for user story ‘**Error! Reference source not found.**’ (the parent user story for this current story) only if this is part of a large update.

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## 1208 – AFSL Website Updates (People Section) (copy)

**Content**

Copy of user story 495 – AFSL Website Updates (People Section)

**Definition of Done**

Copy definition of done from 495 – AFSL Website Updates (People Section)

**Notes**

* All website material is located in [\\AFSL\WebsiteInfo](file:///\\AFSL\WebsiteInfo)

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## 1209 – AFSL Website Updates (Research Section) (copy)

**Content**

Copy of user story 497 – AFSL Website Updates (Research Section)

As a marketing agent, I would like to update the AFSL website “Research” section with new information so I can publicize our activities.

**Definition of Done**

[ ] Coordinate with Chris Lum before starting this user story.

[ ] Update the “Research” section

[ ] Include Most Revelant UAVs (e.g. TEDD, etc.)

[ ] Include a Photo

[ ] Write a Description

[ ] Include Current Projects (newest on top)

[ ] Include a Photo

[ ] Write a Description

[ ] Incorporate Userstories

[x] 1585 – AFSL Website (Research) – JCATI 2016

[ ] 1586 – AFSL Website (Research) – Visual Anchoring

[ ] 1587 – AFSL Website (Research) – MAPPS

[ ] 1588 – AFSL Website (Research) – Quad Plane

[ ] 1589 – AFSL Website (Research) – Mapping

[ ] Create rollover images for each project.

[ ] Review all materials with Chris Lum

[ ] Send mock ups to Kevin Ward.

[ ] Ensure that changes are made and correct on the final website.

**Notes**

* All website material is located in \\AFSL\WebsiteInfo
* The IEEE paper which outlines all of the work from the JCATI project is located in [\\JCATI2013\TechnicalDataPackage\IEEE Paper\CompiledVersions\MAIN\_collision\_awareness\_plugin.pdf](file:///\\JCATI2013\TechnicalDataPackage\IEEE%20Paper\CompiledVersions\MAIN_collision_awareness_plugin.pdf)

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## 1210 – AFSL Website Updates (Publications Section) (copy)

**Content**

Copy of user story 498 – AFSL Website Updates (Publications Section)

As a marketing agent, I would like to update the AFSL website “Publications” section with new information so I can publicize our activities.

**Definition of Done**

[ ] Coordinate with Chris Lum before starting this user story.

[ ] Update the “Publications” section

[ ] Flatten research structure (no more strategic, tactical, dynamics level organization)

[ ] Add new publications.

[ ] Review all materials with Chris Lum

[ ] Send mock ups to Kevin Ward.

[ ] Ensure that changes are made and correct on the final website.

**Notes**

* All website material is located in [\\AFSL\WebsiteInfo](file:///\\AFSL\WebsiteInfo)
* Coordinate with development champion for user story ‘**Error! Reference source not found.**’ (the parent user story for this current story) only if this is part of a large update.

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## 1211 – Investigate Pixhawk 2

**Content**

As a researcher, I would like to investigate the Pixhawk 2.

**Definition of Done**

[ ] Review the following documents:

* <http://www.proficnc.com/>
* <http://ardupilot.org/dev/docs/intel-edison.html>

[ ] Review any other relevant documentation

[ ] Determine the pros, cons and possible uses

[ ] Report results to Dr. Lum

**Notes**

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## 1212 – Flight Test Videos Excel Data

**Content**

As a lab member, I would like to consolidate all AFSL videos onto one document for easier access.

**Definition of Done**

[ ] Create an Excel document contains all videos from AFSL YouTube.

[ ] Tab: Calculate each run with success and failures.

[ ]

**Notes**

* To be determined…

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## 1213 – Flight Test Media Coverage (copy) – 20170407

**Content**

Copy of user story 1212 – Flight Test Media Coverage

As a lab member, I would like to photograph and video tape the flight test on “Date (e.g. 20161126)” @ “Location”.

**Definition of Done**

[ ] Change heading to “User Story ID” – Flight Test Media Coverage (copy) – “Date of Flight Test (e.g. 20161126)”

[ ] Attend the flight test on 20161210 @ Meadowbrooke Farm

[ ] Photograph the white board with the new run number before every test run.

[ ] Videotape every test run of the flying aircraft.

[ ] Make sure to capture the flight tests (number one priority)

[ ] Also capture participants, activities, etc. that can be uploaded onto Facebook

[ ] Upload the files to K drive.

[ ] Sort the media in the K drive into their prospective run folders.

[ ] Notify the person currently updating social media photography to upload pictures and videos.

[ ] Upon the completion of this user story, create a new copy of the original user story 12XX – Flight Test Media Coverage for the next flight test.

**Notes**

* Only photograph and video tape with high quality equipment, your phone does not count.
* Utilize the tripod for stability and try to make sure the lens does not get droplets on it.
* **This is the original UserStory [Read-Only], please make a copy of this for every flight test. Delete this note in the new copy.**

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## 1214 – Social Media Updates (copy) – AUT ‘16

**Content**

Copy of user story 1082 – Social Media Updates

As a lab member, I would like to update the activities of the lab for publicity on the AFSL website, Facebook, and YouTube pages.

**Definition of Done**

[x] Consult with Chris Lum on the activity’s description and prospective posting photos/videos.

[x] Frequently post profiles of lab members and their specific involvement in the lab on Facebook.

For every post-flight test:

[x] Upload selected videos from the flight test onto YouTube.

[x] Update the video description (follow the template on YouTube)

[x] Make sure each video tag includes: university of washington autonomous flight systems laboratory uw afsl test (schoolyear e.g. 20162017) (date e.g. 20161119) (location e.g. meadowbrooke farm) (UAS e.g. tedd) run (run# e.g. 001) (title)

[x] everything is in lowercase

[x] every word has a space in between

[x] exclude all the parenthesis

[x] Make sure the uploaded videos are included in their perspective playlists (it is possible for each video to be in more than one playlist)

[x] Share the videos uploaded onto YouTube on Facebook.

[x] Upload selected photos from the flight test onto Facebook.

[x] Confirm that the photos and videos from each flight test are uploaded onto K drive.

Flight Test:

[x] 20161129 @ Meadowbrooke Farm

[x] 20161210 @ Meadowbrooke Farm

[x] 20161216 @ Meadowbrooke Farm

[x] 20161217 @ Meadowbrooke Farm

[x] At the end of the quarter, please make a new copy user story 1082 – Social Media Updates for the next quarter.

**Notes**

* This is a quarter long commitment, please only pick it up if you can make the time.
* Every flight test for the quarter is to be included under Flight Test.
* Every video and photo needs to be in its best quality, meaning the videos are to be trimmed, and photos to be cropped if deemed necessary.
* Uploaded videos are automatically distributed into its perspective playlists if tagged correctly.
* Uploaded videos will automatically be shared through Twitter.
* Q&A about video tag: “school year (e.g. 20162017)” is considered from first day of summer courses of that year to the day before the first day of summer courses for the following year.

## 1215 – Social Media Updates (copy) – WIN ‘17

**Content**

Copy of user story 1082 – Social Media Updates

As a lab member, I would like to update the activities of the lab for publicity on the AFSL website, Facebook, and YouTube pages.

**Definition of Done**

[x] Consult with Chris Lum on the activity’s description and prospective posting photos/videos.

[x] Frequently post profiles of lab members and their specific involvement in the lab on Facebook.

For every post-flight test:

[x] Upload selected videos from the flight test onto YouTube.

[x] Update the video description (follow the template on YouTube)

[x] Make sure each video tag includes: university of washington autonomous flight systems laboratory uw afsl test (schoolyear e.g. 20162017) (date e.g. 20161119) (location e.g. meadowbrooke farm) (UAS e.g. tedd) run (run# e.g. 001) (title)

[x] everything is in lowercase

[x] every word has a space in between

[x] exclude all the parenthesis

[x] Make sure the uploaded videos are included in their perspective playlists (it is possible for each video to be in more than one playlist)

[x] Share the videos uploaded onto YouTube on Facebook.

[x] Upload selected photos from the flight test onto Facebook.

[x] Confirm that the photos and videos from each flight test are uploaded onto K drive.

Flight Test:

[x] 20170121 @ Meadowbrooke Farm

[x] Include every additional Flight Test from this quarter here…

[x] At the end of the quarter, please make a new copy user story 1082 – Social Media Updates for the next quarter.

**Notes**

* This is a quarter long commitment, please only pick it up if you can make the time.
* Every flight test for the quarter is to be included under Flight Test.
* Every video and photo needs to be in its best quality, meaning the videos are to be trimmed, and photos to be cropped if deemed necessary.
* Uploaded videos are automatically distributed into its perspective playlists if tagged correctly.
* Uploaded videos will automatically be shared through Twitter.
* Q&A about video tag: “school year (e.g. 20162017)” is considered from first day of summer courses of that year to the day before the first day of summer courses for the following year.

## 1216 – Falco Aircraft Manual (part 2)

**Content**

As a lab member, I would like write and publish an aircraft manual for Falco

**Definition of Done**

[ ] Finish Falco’s flight manual by

* determining relevant sections
* filling in flight performance data

[ ] There should be no highlighted or unfinished sections

**Notes**

* The manual is in \FlightOperations\UAS\Falco\FalcoAircraftFlightManual.docx

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## 1217 – White Paper

**Content**

As a researcher, I would like to develop a white paper in order to get funding for future research.

**Definition of Done**

[] Use the example white paper to create a draft for the \_\_\_\_\_ project

[] Submit draft to Dr. Lum and revise as necessary

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## 1218 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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## 1219 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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## 1220 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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## 1221 – SAM Post-Mortem Analysis

**Content**

As a researcher, I would like analyze SAM’s death to conclude the cause and how to avoid it in the future.

**Definition of Done**

[ ] Run the data through the matlab code

[ ] Determine probable cause of failure

[ ] Present findings to everyone

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## 1222 – MFOC Maintenance Post 12/16 flight tests

**Content**

As a lab member, I would like to address the MFOC maintenance items that resulted from the 12/16/16 and 12/17/16 flight tests at Meadowbrook.

**Definition of Done**

[ ] Complete “Winter Items” to-do list \FlightOperations\UAS\MFOC\ConstructionAndMaintenenceLog.docx

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## 1223 – Troubleshoot CERES (Part 1)

**Content**

As a lab member, I would like to troubleshoot the high servo latency and make CERES airworthy again.

**Definition of Done**

[ x] Troubleshoot why CERES’ servos are not responsive

[x ] Fix the problem

[ ] Make sure CERES is airworthy again

**Notes:**

From 12/17/16 mission notes:

Ceres not airworthy. Need to troubleshoot the high latency between the receiver and the AC. It is not responding to the commands smoothly or immediately. GCS received “NO RC Receiver” warning intermittently during the preflight checks

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## 1224 – Troubleshoot TEDD

**Content**

As a lab member, I would like to troubleshoot the TEDD battery issue.

**Definition of Done**

[ ] Determine what TEDD’s periodic “beep beep beep” (ascending musical tone) means. It does this after boot up on the ground.

[ ] Review flight log of a successful TEDD flight for the voltage over time

[ ] Compare to a flight on 12/16 or 12/17

[ ] Troubleshoot why this battery issue might be occurring (voltage drops that cause the battery failsafe to trigger shortly after takeoff)

[ ] If problem is not resolved, ensure that TEDD’s AFM specifies that only 4 cell batteries can be used

**Notes:**

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## 1225 – Falco Rebuild

**Content**

As a lab member, I would like to rebuild Falco.

**Definition of Done**

[ ] Analyze the damage and whether it is possible\economical to rebuild Falco

[ ] If not, determine which onboard equipment is reusable

[ ] Determine if it is worth buying a new airframe to continue this line of research

If so, complete the necessary repairs

[ ] Troubleshoot and come up with a plan of how to have a successful next flight

**Notes:**

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## 1226 – SAM Rebuild

**Content**

As a lab member, I would like to rebuild SAM.

**Definition of Done**

[x] Analyze the damage and whether it is possible/economical to rebuild SAM

[x] If not, determine which onboard equipment is reusable

[x] Determine if it is worth buying a new airframe to continue this line of research

If so, complete the necessary repairs

[x] Troubleshoot and come up with a plan of how to have a successful next flight

**Notes:**

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## 1227 – MicaSense RedEdge Documentation

**Content**

As a lab member, I would like to update the documentation the lab has on the MicaSense RedEdge camera.

**Definition of Done**

[ ] Obtain new version of MicaSense RedEdge user manual

[ ] Finish the MicaSense RedEdge checklist document

**Notes:**

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**1228 – AIAA SciTech Conference Paper Draft Writing (copy)**

**Content**

As a student, I would like to summarize my research in a conference paper submission while working on relevant sections of my thesis so I can graduate

**Definition of Done**

[ ] Write relevant sections of thesis to be added to conference paper

[ ] Ensure mathematical modeling for estimators is sound within flight tracking context

**Notes**

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**1229 – AIAA SciTech Conference Paper Draft Writing (copy)**

**Content**

As a student, I would like to summarize my research in a conference paper submission while working on relevant sections of my thesis so I can graduate

**Definition of Done**

[ ] Write relevant sections of thesis to be added to conference paper

[ ] Ensure mathematical modeling for estimators is sound within flight tracking context

**Notes**

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**1230 - MAPSS Initial Gimbal System Trade Study**

**Content**

As a MAPSS Member, I would like to create a Trade Study on the difference of buying a 2 Axis Camera Gimbal system versus a 3 Axis Camera Gimbal system.

**Definition of Done**

[ ] Research the difference between 2 axis and 3 axis

[ ] Save Documentation on Perforce

[ ] Present Options to team

**Notes:**

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**1231 - MAPSS Project Plan Deliverables**

**Content**

As a MAPSS Member, I would like to complete a portion of the Project Plan Deliverables.

**Definition of Done**

[ ] Complete assigned sections of the Project Plan

[ ] Review and Edit sections with team

[ ] Finalize sections with Team in OverLeaf

[ ] Upload .tex file to Perforce

[ ] Review with Lum before sending out to MicaSense

**Notes:**

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**1232 - MAPSS Project Plan Deliverables (copy)**

**See 1231 – MAPSS Project Plan Deliverables**

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**1233 - MAPSS Project Plan Deliverables (copy)**

**See 1231 – MAPSS Project Plan Deliverables**

**1234 - MAPSS Project Plan Deliverables (copy)**

**See 1231 – MAPSS Project Plan Deliverables**

**1235 - MAPSS AERB Equipment List**

**Content**

Compile a list of equipment need for the new workspace in AERB 120

**Definition of Done**

[ ] Come up with a rough list of necessary equipment for the project

[ ] Determine how to get these items: whether they will be readily available through the department or need to be acquired some other way

[ ] Send list to Fiona Spencer

**Notes:**

fspencer@aa.washington.edu

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**1236 - MAPSS Initial Red Edge Data Acquisition**

**Content**

As a MAPSS member I would like to gain experience in gathering and analyzing the data from a Red Edge camera test.

**Definition of Done**

[ ] Download data from the Atlas Datahub website

[ ] Understand flight test process

[ ] Summarize data and report back

**Notes:**

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**1237 - MAPSS Accessory Sensor Specs and CAD work**

**Content**

As a MAPSS member, I would like to gather important specification data about the Matrice 100 Drone and the Accessory Sensor

**Definition of Done**

[ ] Research and find data on these components

[ ] Upload to Perforce (or K-Drive depending on size)

**Notes:**

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**1238 - MAPSS Accessory Sensor Dummy Model**

**Content**

As a MAPSS member, I would like to create a dummy model of the accessory sensor.

**Definition of Done**

[ ] Using specifications of the imaging component, create a Solidworks model

[ ] Contact accessory model manufacturer to get CAD file

[ ] Upload to Perforce (or K-Drive depending on size)

[ ] Create a physical dummy model of the imaging component for use during testing

**Notes:**

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**1239 - MAPSS Matrice 100 Integration**

**Content**

As a MAPSS member, I would like to create a dummy model of the Matrice main body and gimbal integration surface for integration with the Gimbal system and center of gravity estimations

**Definition of Done**

[ ] Using specs on the Matrice, create a basic Solidworks model

[ ] Upload to Perforce (or K-Drive depending on size)

[ ] Create a physical dummy model of the platform of the Matrice Base

**Notes:**

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**1240 - MAPSS Sprint 1701 Administration**

**Content**

As the MAPSS Administrator, I will manage team meetings, team schedules, and communication practices for the 1701 Sprint

**Definition of Done**

[ ] Continuous and clear flow of communications internally and externally

[ ] Engaging weekly meetings (internally and externally)

[ ] Scheduling meetings and timeline

**Notes:**

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**1241 - MAPSS Sprint 1701Budgeting**

**Content**

As the MAPSS Budgeting lead, I will manage the team budget for the 1701 Sprint and create predicitions for future sprints

**Definition of Done**

[ ] Updating budget sheet (Receipts / Travel / Consultation Fees)

[ ] Engaging weekly meetings (internally and externally)

[ ] Budgeting funds for future expenses

[ ] Continuous and clear flow of communications internally (and sometimes externally)

[ ] Research controller boards to be purchased

[ ] Research some basic skeleton gimbals for purchase

[ ] Research some motors to be used on the gimbal

[ ] Report back to team and purchase items

**Notes:**

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**1242 - MAPSS Pixhawk/MissionPlanner Integration**

**Content**

As a MAPSS member, I would like to research how to integrate a Pixhawk/Mission Planner with a gimbal system.

**Definition of Done**

[ ] Research Pixhawk/Mission Planner guide in notes and other sources

[ ] Create a guide on how to integrate a gimbal system (procedures and recommended servos)

**Notes:**

http://ardupilot.org/copter/docs/common-camera-gimbal.html

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**1243 - MAPSS 2 Axis Camera Gimbal Trade Study**

**Content**

As a MAPSS member, I would like to create a trade study for finding a suitable 2 Axis camera gimbal system.

**Definition of Done**

[ ] Research 4-7 camera gimbals

[ ] Create a Trade study based on the top 3 choices

[ ] Upload Documentation to Perforce

[ ] Report back to team

**Notes:**

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**1244 - MAPSS 2 Axis Camera Gimbal Trade Study**

**See 1243 - MAPSS 2 Axis Camera Gimbal Trade Study**

## 1245 – AFSL Website Updates (People Section) (copy) –

**Content**

Copy of user story 495 – AFSL Website Updates (People Section)

As a marketing agent, I would like to update the AFSL website “People” section with new information so I can publicize our activities.

**Definition of Done**

[ ] Coordinate with Chris Lum before starting this user story.

[ ] Update the “People” section

[ ] Obtain photos and short bios of all active members

[ ] Remove all inactive members to past researchers section

[ ] Determine where old members are now and update/highlight success stories

[ ] Review all materials with Chris Lum

[ ] Send mock ups to Kevin Ward.

[ ] Ensure that changes are made and correct on the final website.

[ ] When the user story is coming to 100% completion, please make a new copy user story 495 – AFSL Website Updates (People Section) for the next quarter/year.

**Notes**

* All website material is located in [\\AFSL\WebsiteInfo](file:///\\AFSL\WebsiteInfo)
* Coordinate with development champion for user story ‘**Error! Reference source not found.**’ (the parent user story for this current story) only if this is part of a large update.
* **This is the original UserStory [Read-Only], please make a copy of this for every quarter or year it is to be updated instead. Delete this note in the new copy.**

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**1246 – MARV JCATI Flight Test**

**Content**

As a lab member, I would like to prep and flight test MARV using the JCATI flight path.

**Definition of Done**

[ x] Ensure MARV airworthiness

[ x] Ensure JCATI flight path is ready to go

[ x] Fly the flight path several times in preparation for a flight with Argo

**Notes:**

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**1247 – Plan a Snow Excursion**

**Content**

As a flight tester, I would like to plan a flight test in a snowy location so we can try using photogrammetry techniques over snow.

**Definition of Done**

[ ] Find a location to flight test in the snow

[ ] Run a rough feasibility analysis (cost, time, etc)

[ ] Get necessary permissions (land owner, etc)

[ ] Determine necessary equipment we will need to bring

[ ] Plan test

[ ] Execute test

**Notes:**

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**1248 – SciTech Paper**

**Content**

As a lab member, I would like to work on the SciTech Paper

**Definition of Done**

[ ] TBD

**Notes:**

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**1249 – Amazon Catalyst Proposal**

**Content**

As a lab member, I would like to create a funding proposal for Amazon Catalyst.

**Definition of Done**

[ ] TBD

**Notes:**

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**1250 – JCATI Proposal**

**Content**

As a lab member, I would like to create a funding proposal for JCATI.

**Definition of Done**

[ ] TBD

**Notes:**

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**1251 – Flight Ops Administration (1701)**

**Content**

As flight operations director, I would like to complete the following tasks to administrate flight operations.

**Definition of Done**

[ ] Coordinate and administrate flight tests

**Notes**

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**1252 – Turnigy Talon Tricopter (T3) Build (copy)**

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story 1184 – Turnigy Talon Tricopter (T3) Build (copy)

**Notes**

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## 1253 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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**1254 – Purchase New Skywalker 1900**

**Content**

As a lab member, I would like to research and purchase a new Skywalker 1900 to use for parts.

**Definition of Done**

[ ] Find Skywalker 1900 online

[ ] Order through Dr. Lum or Hannah

**Notes**

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## 1255 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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## 1256 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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## 1257 – Create a TRAPIS Promo Video (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes:**

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## 1258 – Weather Station & Equipment Functionality

**Content**

As a lab member, I would like to research and purchase a weather station for the lab. I would also like to determine the functionality and best uses of it and some of the other lab equipment.

**Definition of Done**

[ ] Find a simple weather station for the lab to purchase.

* Allows basic measurements of temperature and barometric pressure
* Portable and small so we can bring it out to our flight tests

[ ] Become familiar with the use of the weather station

[ ] Become familiar with the use of our anemometer

[ ] Become familiar with the use of our RF spectrum analyzer

[ ] Determine how we can most easily and effectively integrate everything into our operations

* Write up some sort of AFSL operating manual so that anyone can figure this equipment out

**Notes:**

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## 1259 – MFOC Maintenance Post 12/16 flight tests

**Content**

Copy of user story 1222 – MFOC Maintenance Post 12/16 flight tests

**Definition of Done**

Copy of definition of done of user story 1222 – MFOC Maintenance Post 12/16 flight tests

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## 1260 – Falco Rebuild

**Content**

Copy of user story 1225 – Falco Rebuild

**Definition of Done**

Copy of definition of done of user story 1225 – Falco Rebuild

**Notes:**

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## 1261 – Camera Cases

**Content**

As a lab member, I would like to purchase protective cases for the lab’s DSLR and camcorder cameras.

**Definition of Done**

[x] Research cases that will fit the Canon EOS Rebel T5 and Canon Vixia HF R400

[x] Order the best cases based on price, durability, protection, and versatility

**Notes:**

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## 1262 – Undergrad Research Symposium

**Content**

As a researcher, I would like to present my project at the UW Undergrad Research Symposium.

**Definition of Done**

[ ] Talk to Dr. Lum for details on the symposium

[ ] Create a poster outlining your research

[ ] Present in Mary Gates Hall on Friday, May 19th, 2017

**Notes:**

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## 1263 – Flight Training Program – Multi-Rotor

**Content**

As a future sUAS pilot, I would like to complete the AFSL required training to become eligible to fly the lab’s multi-rotor aircraft.

**\*\*Flight training must be taken seriously. At some point you could be asked to safely takeoff, fly and land a $10,000 sensor in less than ideal weather, so you need to be ready to meet this challenge whenever it arises\*\***

**Definition of Done**

[x] Before anything else, read the training information located here: **\FlightOperations\Operators\Training\FlightTrainingInformation.docx**

[ ] Read through and understand the Airworthiness Directives located: **\FlightOperations\Operations\AFSLFlightOperations\AFSLFlightOperationsManual.docx**

[ ] Log at least one hour of productive flight time on either a Phantom or Solo Quadcopter. Additional time may be spent on other airframes, but a minimum one hour on a basic multi-rotor are required. This includes the following:

[ ] Log at one hour here in the gray section of this document: **\FlightOperations\Operators\Training\FlightTrainingRecords.xlsx**

[ ] Practice takeoffs

[ ] Practice hovering/loitering and other basic maneuvers

[ ] Practice reverse orientation flying

[ ] Perform 5 safe landings on a small target (eg. a table, landing pad, etc)

[ ] Demonstrate to a lead pilot proficiency on takeoff, cruise, reverse orientation and landing

[ ] Fly MARV or CERA with buddy box system in the field and complete or show proficiency in the following:

[ ] Three successful takeoffs (in whatever mode is deemed best for training by instructor pilot)

[ ] Reverse orientation

[ ] Flight in stabilize mode

[ ] Flight in loiter mode

[ ] Flight in any other common modes

[ ] Proficiency in switching into and out of auto mode

[ ] Three successful landings (in whatever mode is deemed best for training by instructor pilot)

[ ] Log all time here in the blue section of this document: **\FlightOperations\Operators\Training\FlightTrainingRecords.xlsx**

[ ] Fly ARGO with buddy box system and show proficiency in the following:

[ ] Three successful takeoffs in Loiter mode

[ ] Fly a basic circular flight path

[ ] Three successful landings in Loiter mode

[ ] Demonstrate to a lead pilot proficiency on takeoff, cruise, reverse orientation and landing

[ ] Proficiency in switching into auto mode and proficiency creating and executing an auto flight path with that does the following:

[ ] Performs an auto takeoff

[ ] Fly to a height of 30 feet

[ ] Executes 4 waypoints, 2 of which the aircraft pauses for 15 seconds

[ ] Returns to Home

[ ] Executes an auto landing

[ ] Receive sign-off for multi-rotor solo flight

**Notes**

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## 1264 – MAPSS Analyze Previous Flight Data

**Content**

As a MAPSS member, I would like to look at flight and camera data from previous tests to get a hold of  the process

**Definition of Done**

[ ] Contact Hanna Rotta to get access to previous tests

[ ] Understand flight test workflow and analysis

[ ] Report back to team about findings

**Notes:**

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**1265 – Research Parameter Loading Order in Checklists**

**Content**

As a researcher, I would like to research the order parameters are loaded onto the aircrafts to make sure that important parameters are not being overwritten.

**Definition of Done**

[ ] Compare the loaded parameters and parameters gathered when Mission Planner first connects to the Pixhawk

[ ] Compare parameters after connecting Mission Planner to Pixhawk with parameters gathered after current checklist procedures

[ ] Determine if important parameters are being overwritten

[ ] Determine if the pre-flight checklist needs to be altered

[ ] Determine if checklist order could have caused crashes of AFSL aircrafts

**Notes**

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**1266 – MAPSS Passive Damping Designs Research**

**Content**

As a researcher, I would like to research damping designs that can be implemented into a gimbal system

**Definition of Done**

[ ] Perform preliminary research on standard damping designs

[ ] Coordinate with AFSL members who have previous experience with damping

[ ] Document results somewhere where it is accessible to other MAPSS members

[ ] Report back to group

**Notes**

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## 1267 – MAPSS Sprint 1701 Communication Focal Duties

**Content**

As the communication focal for the MAPSS team, I will handle external communication and publication of our work.

**Definition of Done**

[ ] Document work done thorugh pictures and video

[ ] Communicate with senior capstone administrators to understand publication practices

[ ] Create publication ready images and documentation

**Notes**

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## 1268 – MAPSS Senior Capstone Grant Application

**Content**

As the grant application writer, I want to secure extra funding for our project through the senior design project grant

**Definition of Done**

[ ] Look over application process and understand guidelines

[ ] Write a draft of an essay explaining the reasoning for extra funding

[ ] Share with group and get feedback and edits

**Notes**

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**1269 – Argo Repairs**

**Content**

As a lab developer, I would like to repair Argo so that it is airworthy

**Definition of Done**

[x] Examine if the motor can be revived

[x] Order necessary replacement parts

[x] Replace broken landing gear

[x] Replace broken motor

[x] Replace broken props

[x] Ensure general airworthiness

**Notes**

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**1270 – Argo Test Flights**

**Content**

As a lab developer, I would like to test multiple flight patterns with Argo.

**Definition of Done**

[x] Take off Argo in stabilize, loiter mode, and fly manually

[x] Create flight patterns for Argo

[x] Perform autonomous flight

[x] Execute JCATI flight test patterns with Argo

**Notes**

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| * Manual flight is really difficult due to Argo’s power and touchy controls. * It would be best to stick to auto mode and let the mission planner do the flying * Avoid stabilize mode whenever possible (Shouldn’t really be a reason to use it) * If flying manually, use loiter mode |

**1271 – Piksi Ground Test and 3d printed Mount**

**Content**

As a lab developer, I would like to get familiar with the piksi GUI and ground test the system

**Definition of Done**

[x] Become familiar with simulator mode

[x] Become familiar with setting up rover and base station modes

[x] Survey the ground station position

[x] Ensure the two piksi devices are communicating over radio and have satellite locks

[x] Check for fixed rtk positioning

[x] Walk around the base station in a circle and verify the rover is receiving accurate data

**Notes**

**1272 – Piksi 3d printed Mount**

**Content**

As a lab developer, I would like to prepare a mount for flight testing the Piksi GPS

**Definition of Done**

[] Remove magnets from Piksi antennae

[x] 3d print a mount

[] Create a grounding plate for the piksi

[] Attach grounding plates to acrylic plate

[] Attach acrylic plate to 3d printed mount

**Notes**

**1273 – Archival and Data Analysis for Mission 1/21/17**

**Content**

As a researcher, I would like to archive the data gathered on the flight mission from 1/21/17.

**Definition of Done**

[ ] Ensure all Data flash logs and telemetry logs for each recorded flight are put into a file structure

[ ] Convert the logs into matlab files

[ ] Upload Raw Data and Media to KDrive with permission of Dr. Lum

[ ] Set up robocopy

[ ] Set up matlab Data Analysis file

**Notes**

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**1273 – MAPSS MicaSense Rededge CAD Work**

**Content**

As a researcher, I would like to analyze the Rededge using Solidworks.

**Definition of Done**

[ ] Gather STEP files from David at MicaSense

[ ] Analyze and edit part file for use in a gimbal set up

[ ] integrate accessory sensory into analysis

**Notes**

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## 1274 – JCATI To-Do Items (Copy)

**Content**

As a lab member, I need to prepare for the upcoming SDR flight and ground tests for the JCATI project.

**Definition of Done**

[ ] Determine the exact frequency of primary c2 transmitter

[ ] Obtain an Ethernet cable for the connection between GCS to GSN

[ ] Generate a master project vision document

[ ]Outline hardware components

[ ]Identify all wireless links: primary transmitter, 3dr radio, wifi, bladeRF, fpv, etc.

[ ]Identify nomenclature an dnames for all components and actors

[ ] Research picksi RTK

[ ] Update flight test cards

[ ] Different altititudes

[ ] Tripod on top of trailer

[ ] Update MARV AFM

[ ] Marco Polo tracker and arm/disarm procedure

[ ] Create ARGO AFM

[ ] Edit Noshad’s Document

[ ] ARGO indoor flight test

**Notes**

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**1275 – MARV JCATI Flight Test (Copy)**

**Content**

As a lab member, I would like to prep and flight test MARV using the JCATI flight path.

**Definition of Done**

[ x] Ensure MARV airworthiness

[ x] Ensure JCATI flight path is ready to go

[ x] Fly the flight path several times in preparation for a flight with Argo

**Notes:**

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**1276 – MAPSS Flight Test Analysis**

**Content**

As a researcher, I would like to understand and get practice analyzing flight test data in order to be better prepared for later flight tests.

**Definition of Done**

[ ] Understand the file structure for flight test data

[ ] Use the MATLAB script to analyze the data

[ ] Create a short presentation to show off during a weekly AFSL Meeting

**Notes**

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**1277 – MAPSS Flight Test Analysis (copy)**

**Content**

As a researcher, I would like to understand and get practice analyzing flight test data in order to be better prepared for later flight tests.

**Definition of Done**

[ ] Understand the file structure for flight test data

[ ] Use the MATLAB script to analyze the data

[ ] Create a short presentation to show off during a weekly AFSL Meeting

**Notes**

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**1278 – MAPSS Flight Test Analysis (copy)**

**Content**

As a researcher, I would like to understand and get practice analyzing flight test data in order to be better prepared for later flight tests.

**Definition of Done**

[ ] Understand the file structure for flight test data

[ ] Use the MATLAB script to analyze the data

[ ] Create a short presentation to show off during a weekly AFSL Meeting

**Notes**

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**1279 – MAPSS Flight Test Analysis (copy)**

**Content**

As a researcher, I would like to understand and get practice analyzing flight test data in order to be better prepared for later flight tests.

**Definition of Done**

[ ] Understand the file structure for flight test data

[ ] Use the MATLAB script to analyze the data

[ ] Create a short presentation to show off during a weekly AFSL Meeting

**Notes**

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**1280 – MAPSS Flight Test RedEdge Data Acquisition**

**Content**

As a researcher, I would like to run a flight test to gather a data set from the MicaSense RedEdge camera.

**Definition of Done**

[ ] Coordinate with Hannah to get a flight test done with the MicaSense Rededge without a gimbal

[ ] Perform the flight test

[ ] Analyze the data from the flight test and measure the improvement from using a gimbal after doing another test with the gimbal

**Notes**

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**1281 – MAPSS Flight Test RedEdge Data Acquisition (copy)**

**Content**

As a researcher, I would like to run a flight test to gather a data set from the MicaSense RedEdge camera.

**Definition of Done**

[ ] Coordinate with Hannah to get a flight test done with the MicaSense Rededge without a gimbal

[ ] Perform the flight test

[ ] Analyze the data from the flight test and measure the improvement from using a gimbal after doing another test with the gimbal

**Notes**

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**1282 – MAPSS Flight Test RedEdge Data Acquisition (copy)**

**Content**

As a researcher, I would like to run a flight test to gather a data set from the MicaSense RedEdge camera.

**Definition of Done**

[ ] Coordinate with Hannah to get a flight test done with the MicaSense Rededge without a gimbal

[ ] Perform the flight test

[ ] Analyze the data from the flight test and measure the improvement from using a gimbal after doing another test with the gimbal

**Notes**

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**1283 – MAPSS Flight Test RedEdge Data Acquisition (copy)**

**Content**

As a researcher, I would like to run a flight test to gather a data set from the MicaSense RedEdge camera.

**Definition of Done**

[ ] Coordinate with Hannah to get a flight test done with the MicaSense Rededge without a gimbal

[ ] Perform the flight test

[ ] Analyze the data from the flight test and measure the improvement from using a gimbal after doing another test with the gimbal

**Notes**

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**1284 – Flight Training Program (copy)**

**Content**

Copy of user story 1127 – Flight Training Program

As a future sUAS pilot, I would like to complete the AFSL required training to become eligible to fly the lab’s aircraft.

**Definition of Done**

[x] Before anything else, read the training information located here: **\FlightOperations\Operators\Training\FlightTrainingInformation.docx**

[x] Log at least three hours of productive simulator time on PhoenixRC on the computer nearest the door. Please use the **Multiplex EasyStar AFSL\_Skywalker\_Trainer** model (listed under the favorites – this is important because the version that doesn’t say AFSL\_Skywalker\_Trainer does not have ailerons). Additional time may be spent on other airframes, but a minimum three hours on the EasyStar are required. This includes the following:

[ ] Log at least three hours here in the gray section of this document: **\FlightOperations\Operators\Training\FlightTrainingRecords.xlsx**

[x] Practice flying a basic traffic pattern

[x] Practice reverse orientation flying

[x] Perform 15 safe landings on a Dead Calm day (weather can be adjusted in the settings)

[x] Perform 15 safe landings on a Brisk day

[x] Perform 15 safe landings on a Fair Wind day

[x] Demonstrate to a lead pilot proficiency on takeoff, cruise, reverse orientation and landing

[x] Fly Ben with buddy box system in the field and complete or show proficiency in the following:

[x] General flight training on 20170303

[x] Log all time here in the blue section: **\FlightOperations\Operators\Training\FlightTrainingRecords.xlsx**

[ ] Fly Anakin with buddy box system in the field and complete or show proficiency in the following:

[ ] Three successful takeoffs

[ ] Reverse orientation

[ ] Cruise in manual mode

[ ] Cruise in stabilize mode

[ ] RTL mode

[ ] Three successful landings

[ ] Log all time here in the blue section: **\FlightOperations\Operators\Training\FlightTrainingRecords.xlsx**

[ ] Receive approval for fixed wing solo flight

**Notes**

* Rotor flight will require rotor specific training

**1285 – Electronics Development Workstation**

**Content**

As a lab member, I would like to convert the Arduino workstation into an electronics development workstation so that the space can be available for soldering and electronics development.

**Definition of Done**

[ ] Build a shelf to hold the scopes, power supplies, etc.

[ ] Install the HP Envy laptop and monitor at the station

[ ] Install soldering irons, helping hands, etc.

[ ] Obtain necessary components (jumpers, breadboards, etc)

[ ] Clean up the work area

**Notes**

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**1286 – Flight Incidents Documentation**

**Content**

As a lab member, I would like to develop a centralized location to store all of the information about our flight incidents.

**Definition of Done**

[ ] Compile information about our airplane crashes

[ ] Analyze data about flight crashes

[ ] Write up this info including possible causes, ways to mitigate these crashes in the future, etc in a report format

**Notes**

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**1287 – Anakin Post-Mortem Analysis**

**Content**

As a lab member, I would like to determine the cause of Anakin’s untimely death.

**Definition of Done**

[ ] Analyze video footage and documented reports about the crash

[ ] Analyze Matlab data

[ ] Analyze data available on Mission Planner, using tlogs and data flash logs

[ ] Determine the most likely cause and present it to the group at a weekly meeting

[ ] Figure out the failsafe parameters that apply to this sort of situation (loss of RC receiver) and if these need changing in order to prevent this in the future. Ex. FS\_LONG\_ACTN and FS\_SHORT\_ACTN

[ ] If so, make this change across all of the fixed wing aircraft (if necessary, conduct a flight test to ensure this won’t cause anything else to malfunction)

**Notes**

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## 1288 – Anakin Rebuild

**Content**

As a lab member, I would like to rebuild Anakin.

**Definition of Done**

[ ] Analyze the damage and whether it is possible/economical to rebuild Anakin

[ ] If not, determine which onboard equipment is reusable

[ ] Determine if it is worth buying a new airframe to continue this line of research

If so, complete the necessary repairs

[ ] Troubleshoot and come up with a plan of how to have a successful next flight

[ ] Record all changes on Anakin’s construction and modification log

**Notes:**

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## 1289 – SAM Rebuild (copy)

**Content**

Copy of user story 1226 – SAM Rebuild

**Definition of Done**

Copy definition of done from user story 1226 – SAM Rebuild

**Notes**

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## 1290 – Anakin Rebuild (copy)

**Content**

Copy of user story 1288 – Anakin Rebuild

**Definition of Done**

Copy definition of done from user story 1288 – Anakin Rebuild

**Notes**

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**1291 – MAPSS Poster Session 2/4**

**Content**

As a researcher within the MAPSS Team, I would like to prepare for and present at the poster session on February 4th.

**Definition of Done**

[ ] Work with the three other MAPSS members to design a publication worthy poster

[ ] Coordinate quickly with David to make sure everything on the poster is allowed to be shared

[ ] Attend and contribute to the presentation at the poster session on Friday 2/4

**Notes**

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**1292 – MAPSS Poster Session 2/4 (copy)**

**Content**

As a researcher within the MAPSS Team, I would like to prepare for and present at the poster session on February 4th.

**Definition of Done**

[ ] Work with the three other MAPSS members to design a publication worthy poster

[ ] Coordinate quickly with David to make sure everything on the poster is allowed to be shared

[ ] Attend and contribute to the presentation at the poster session on Friday 2/4

**Notes**

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**1293 – MAPSS Poster Session 2/4 (copy)**

**Content**

As a researcher within the MAPSS Team, I would like to prepare for and present at the poster session on February 4th.

**Definition of Done**

[ ] Work with the three other MAPSS members to design a publication worthy poster

[ ] Coordinate quickly with David to make sure everything on the poster is allowed to be shared

[ ] Attend and contribute to the presentation at the poster session on Friday 2/4

**Notes**

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**1294 – MAPSS Poster Session 2/4 (copy)**

**Content**

As a researcher within the MAPSS Team, I would like to prepare for and present at the poster session on February 4th.

**Definition of Done**

[ ] Work with the three other MAPSS members to design a publication worthy poster

[ ] Coordinate quickly with David to make sure everything on the poster is allowed to be shared

[ ] Attend and contribute to the presentation at the poster session on Friday 2/4

**Notes**

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**1295 – MAPSS Multiwii Gimbal Integration**

**Content**

As a researcher within the MAPSS Team, I would like to integrate the Multiwii microcontroller into the gimbal system.

**Definition of Done**

[ ] Analyze and understand controller introduction within gimbal systems

[ ] work with the other MAPSS members to tinker with the hardware and software to integrate the new controller

[ ] successfully integrate the Multiwii

[ ] Document Results

**Notes**

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**1296 – MAPSS Multiwii Gimbal Integration (copy)**

**Content**

As a researcher within the MAPSS Team, I would like to integrate the Multiwii microcontroller into the gimbal system.

**Definition of Done**

[ ] Analyze and understand controller introduction within gimbal systems

[ ] work with the other MAPSS members to tinker with the hardware and software to integrate the new controller

[ ] successfully integrate the Multiwii

[ ] Document Results

**Notes**

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**1297 – MAPSS Multiwii Gimbal Integration (copy)**

**Content**

As a researcher within the MAPSS Team, I would like to integrate the Multiwii microcontroller into the gimbal system.

**Definition of Done**

[ ] Analyze and understand controller introduction within gimbal systems

[ ] work with the other MAPSS members to tinker with the hardware and software to integrate the new controller

[ ] successfully integrate the Multiwii

[ ] Document Results

**Notes**

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**1298 – MAPSS Multiwii Gimbal Integration (copy)**

**Content**

As a researcher within the MAPSS Team, I would like to integrate the Multiwii microcontroller into the gimbal system.

**Definition of Done**

[ ] Analyze and understand controller introduction within gimbal systems

[ ] work with the other MAPSS members to tinker with the hardware and software to integrate the new controller

[ ] successfully integrate the Multiwii

[ ] Document Results

**Notes**

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## 1299 – Student Technology Fee Proposal (copy) – LIDAR

**Content**

Copy of user story 479 – Student Technology Fee Proposal

As a project manager, I would like to submit a proposal to the UW Student Technology Fee to see if we can obtain funding for some of our purchases.

**Definition of Done**

[x] Coordinate with Chris Lum before starting this story.

[x] Read about the STF proposal process at <https://techfee.washington.edu/>

[x] Read past successful proposals in related areas. Two from David Shean are

[x] <https://techfee.washington.edu/proposals/2013-079/>

[x] <https://techfee.washington.edu/proposals/2014-059/>

[x] Coordinate with Eleanor Forbes and get her advice on successful proposals to the STF.

[x] Add additional tasks to this user story as appropriate (for example obtaining relevant student testimonials and department support)

[x] Ensure that deadline for the proposal is being tracked by Chris Lum

[x] Create a list of equipment to ask for and create an appropriate budget.

[x] Obtain signatures

[x] Author

[x] Main Contact

[x] Budget Contact

[x] Dean Contact

[x] Create proposal and get this reviewed with Hannah and Chris.

[x] Submit the proposal.

**Definition of Done**

Copy definition of done from user story 479 – Student Technology Fee Proposal

## 1300 – Apprehend the usage of Image Acquisition Toolbox

**Content**

As a developer in image processing, I would like to learn technique that allows image processing on live footage using Matlab Image Acquisition Toolbox.

**Definition of Done**

[x] Check document online to learn about its usage

[x] Try and apply Image Acquisition Toolbox to the object following algorithm

[x] Do a successful test

[] upload successful demo onto Perforce

## 1301 – Unit test for integrated visual anchoring algorithm

**Content**

As a developer working on visual anchoring projects, I would like to conduct unit tests on how the image processing algorithm integrates with the slant range algorithm.

**Definition of Done**

[] Integrate object tracking code with the slant range algorithm

[] Write unit tests on each junction of the integrated code

[] Try integrate in the MAIN\_Algorithm code

[] Write further unit tests on newly integrated code

[] Pass all tests

[] Upload bug-free algorithm and test documents to the Perforce

## 1302 – Clean up unused visual anchoring code

**Content**

As a developer working on visual anchoring project, I’d like to organize the work space and clean out code that are not used in the algorithm.

**Definition of Done**

[] Decide which folders in Visual Anchoring Folder contains unused/untrustworthy code

[] Remove the code from Perforce

## 1303 – Recruit more people for visual anchoring project

**Content**

As a developer working on visual anchoring project, I’d like to recruit more people to join the project so that progress can be made at a higher efficiency.

**Definition of Done**

[] Send out email through AFSL mailing list about needing more people for visual anchoring

[] Assign tasks to specific people

[] Get new people in:

[] Matlab coding

[] Video transmission

[] Plane setup

## 1304 – Ground test 1 for visual anchoring

**Content**

As a developer working on visual anchoring project, I’d like to conduct a ground test to test the accuracy of the tracking algorithm and the slant range algorithm

**Definition of Done**

[] Conduct the test on a open space

[] Stick the plane on top of the stick and have a person walk around target while holding the rod

[] Should test with the camera that’s meant to be used in actual flight test

[] Should have the ground station set up to receive transmitted data on euler angles and slant range

## 1305 – Develop and Document Slant Range Algorithm

**Content**

As a developer working on visual anchoring project, I’d like to develop a slant range algorithm to be used within the CONDOR vision system.

**Definition of Done**

[] Create Matlab code that processes tracking and mission planner inputs and outputs slant range

[] Document code within Matlab and create powerpoint presentation describing conceptual ideas of algorithm

## 1306 – Configure and Install Camera Gimbal and Video Transmitter

**Content**

As a developer working on visual anchoring project, I’d like to configure and install the camera gimbal and video transmitter on the CONDOR aircraft.

**Definition of Done**

[] Install the camera gimbal and video transmitter on CONDOR (ensure correct connections)

[] Configure camera gimbal servo controls using transmitter G and configure Mobius Action camera to transmit video to video receiver and capture card

[] Conduct test to make sure capture card can receive live footage from the Mobius Action camera

## 1307 – Unit Test Slant Range Algorithm

**Content**

As a developer working on visual anchoring project, I’d like to unit test the developed slant range algorithm.

**Definition of Done**

[] Create sufficient test cases and expected slant ranges for each test case to be used to test the code

[] Ensure slant range code works for each test case

## 1308 – Clean up unused visual anchoring code (copy)

**Content**

As a developer working on visual anchoring project, I’d like to organize the work space and clean out code that are not used in the algorithm.

**Definition of Done**

[] Decide which folders in Visual Anchoring Folder contains unused/untrustworthy code

[] Remove the code from Perforce

## 1309 – Investigating RC Inputs and Outputs

**Content**

As a researcher, I would like to investigate the remote controlled inputs and outputs and the spikes that are processed in Matlab and Mission Planner.

**Definition of Done**

[ ] Compare Anakin's Flight046 to previous Anakin flights in Matlab

[ ] Investigating how the data flash and telemetry logs record the inputs and outputs and look for any "spikes" in RC output that was not inputted by the PIC

[ ] Investigate how a connection drop in RC controller could affect the inputs and outputs

[ ] Research any other queries on this topic

## 1310 – Student Technology Fee Proposal (copy) – LIDAR

**Content**

Copy of user story 479 – Student Technology Fee Proposal

## 1311 – Optimizing Various Mission Planner Parameters

**Content**

As a researcher, I would like to investigate some of the parameters on mission planner and determine the best settings for them.

**Definition of Done**

[ ] Research to determine what the optimum stream rate parameters are. For example, most of our planes have been using 4Hz for some of the stream rates, while MARV uses 10Hz. We should decide which stream rate is best and standardize all of the aircraft. These parameters are more specifically:

* SR1\_EXTRA1
* SR1\_EXTRA2
* SR1\_POSITION

[ ] Research the parameters associated with a lost link/lost RC receiver and determine what these parameters should be in order to ensure the airplane continues to fly safely during one of these events. i.e. we don’t want to pull an Anakin nose dive again.

[ ] Research what the COMPASS\_DEC parameter does and where it gets its value from. Also research the compass calibration process. Determine if we need to start doing the compass calibration each flight test at the location. Currently, we do the compass calibration once, usually outside of AERB which could be affected by all of the interference associated with this part of campus - close to labs and buildings, etc that conduct high energy experiments.

**Notes:**

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**1312 – Flight Training Program – Multi-Rotor (copy)**

**Content**

Copy of user story 1263 – Flight Training Program

## 1313 – Aircraft Part Familiarization

**Content**

Copy of user story 1079 – Aircraft Part Familiarization

**1314 – Part 107 Test Preparation (copy)**

**Content**

As a researcher, I would like to prepare for and take the FAA Part 107 Commercial Remote Pilot Certification test.

**Definition of Done**

[x] Take the online course offered by the FAA

[x] Take the three practice tests on the network drive

[x] Study all topics identified as weak when taking practice tests

[x] Take the part 107 test

[x] Do the paperwork to get the license from the FAA

[x] Do the paperwork to get reimbursed for test

**Notes**

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## 1315 – Anakin Crash Analysis

**Content**

As a researcher, I would like analyze Anakin’s death to conclude the cause and how to avoid it in the future.

**Definition of Done**

[ ] Analyze dataflash logs

[ ] Determine probable cause of failure

[ ] Test airplane behavior with actual hardware

[ ] Present findings to everyone

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## 1316 – Swarm Waiver

**Content**

As a researcher, I would like apply for a waiver to fly multiple UAVs at once.

**Definition of Done**

[ ] Research waiver requirements \FlightOperations\Operations\COWs\Part107Waiver\_Instructions.pdf and \FlightOperations\Operations\COWs\Part107Waiver\_PerformanceBasedStandards.pdf

[ ] Research what other people have done to get this waiver previously

[ ] Refer to AFSL’s altitude waiver for inspiration \FlightOperations\Operations\COWs\AltitudeWaiver\107W-2016-01765\_51bsigned.pdf

[ ] Ensure our aircraft can meet requirements

[ ] Write waiver

[ ] Ensure waiver is peer reviewed

[ ] Submit

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## 1317 – MAPSS PDR Session (3/10)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the PDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1318 – MAPSS PDR Session (3/10) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the PDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1319 – MAPSS PDR Session (3/10) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the PDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1320 – MAPSS PDR Session (3/10) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the PDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1321 – MAPSS CDR Session (4/28)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the CDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1322 – MAPSS CDR Session (4/28) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the CDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1323 – MAPSS CDR Session (4/28) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the CDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1324 – MAPSS CDR Session (4/28) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the CDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1325 – MAPSS FDR Session (6/5)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the FDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1326 – MAPSS FDR Session (6/5) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the FDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1327 – MAPSS FDR Session (6/5) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the FDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1328 – MAPSS FDR Session (6/5) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the FDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1329 – MAPSS Meeting Attendance Sprint 1702

**Content**

As a MAPSS Team member, I would like to take part in and be present at all meetings

**Definition of Done**

[ ] Compile previous work done

[ ] Arrive at meetings on time and ready to participate Monday, Tuesday and biweekly Thursday

[ ] Compile personal notes and info to access and refer to later

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## 1330 – MAPSS Meeting Attendance Sprint 1702

**Content**

As a MAPSS Team member, I would like to take part in and be present at all meetings

**Definition of Done**

[ ] Compile previous work done

[ ] Arrive at meetings on time and ready to participate Monday, Tuesday and biweekly Thursday

[ ] Compile personal notes and info to access and refer to later

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## 1331 – MAPSS Meeting Attendance Sprint 1702

**Content**

As a MAPSS Team member, I would like to take part in and be present at all meetings

**Definition of Done**

[ ] Compile previous work done

[ ] Arrive at meetings on time and ready to participate Monday, Tuesday and biweekly Thursday

[ ] Compile personal notes and info to access and refer to later

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## 1332 – MAPSS Meeting Attendance Sprint 1702

**Content**

As a MAPSS Team member, I would like to take part in and be present at all meetings

**Definition of Done**

[ ] Compile previous work done

[ ] Arrive at meetings on time and ready to participate Monday, Tuesday and biweekly Thursday

[ ] Compile personal notes and info to access and refer to later

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## 1333 – MAPSS Gimbal Flight Test- Prototype 1 (3/4)

**Content**

As a MAPSS Team member, I would like to take part in and perform the flight test on 3/4

**Definition of Done**

[ ] Coordinate with Connor and Zach to combine flight tests

[ ] Get prototype 1 to be attachable to ARGO and verify fidelity

[ ] Travel to Flight test location and oversee your duty during the test

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## 1334 – MAPSS Gimbal Flight Test- Prototype 1 (3/4) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and perform the flight test on 3/4

**Definition of Done**

[ ] Coordinate with Connor and Zach to combine flight tests

[ ] Get prototype 1 to be attachable to ARGO and verify fidelity

[ ] Travel to Flight test location and oversee your duty during the test

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## 1335 – MAPSS Gimbal Flight Test- Prototype 1 (3/4) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and perform the flight test on 3/4

**Definition of Done**

[ ] Coordinate with Connor and Zach to combine flight tests

[ ] Get prototype 1 to be attachable to ARGO and verify fidelity

[ ] Travel to Flight test location and oversee your duty during the test

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## 1336 – MAPSS Gimbal Flight Test- Prototype 1 (3/4) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and perform the flight test on 3/4

**Definition of Done**

[ ] Coordinate with Connor and Zach to combine flight tests

[ ] Get prototype 1 to be attachable to ARGO and verify fidelity

[ ] Travel to Flight test location and oversee your duty during the test

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## 1337 - MAPSS Gimbal-less Rededge Flight Test

**Content**

As a MAPSS Team member, I would like to take part in and perform the flight test in March with the MicaSense Rededge without a gimbal.

**Definition of Done**

[ ] Coordinate with Hannah to work out a flight test card

[ ] Get prototype 1 to be attachable to a quadcopter and verify fidelity

[ ] Attach MicaSense Rededge

[ ] Travel to Flight test location and oversee your duty during the test

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## 1338 - MAPSS Accessory Sensor Testing

**Content**

As a MAPSS Team member, I would like to borrow the accessory sensor from MicaSense and perform thermal testing with vibrational testing

**Definition of Done**

[ ] Coordinate with David to get the accessory sensor

[ ] Find a secure location to store the camera

[ ] Create a test bed for the sensor

[ ] Perform tests to determine the quality of data while attached to the gimbal

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**1339 – MAPSS Vibrational Testing Setup**

**Content**

As a researcher, I would like to research damping designs using the vibrational table

**Definition of Done**

[ ] Perform preliminary research on standard damping designs

[ ] Coordinate with Aman and use shaker table for testing on gimbal

[ ] Document results and report back to the team

**Notes**

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## 1352 – VTOL/QuadPlane

**Content**

As a lab member, I would like to investigate adding VTOL functionality to an X8, or other relevant fixed wing platform.

**Definition of Done**

[ ] Investigate what other people have done (see video links below)

[ ] Investigate QuadPlane <http://ardupilot.org/plane/docs/quadplane-support.html>

[ ] Can this or something similar also apply to tricopter configuration?

[ ] Become very familiar with all the parameters involved and how it integrates with mission planner and the RC transmitter

[ ] Determine what hardware is required to integrate with our X8s

[ ] Test hardware and software functionality before integrating on an airframe (maybe see if you can make this work using a hardware in the loop or similar configuration)

[ ] Integrate with an X8

[ ] Create a test card

**Notes**

See vidoes for proof of concept

a.       <https://www.youtube.com/watch?v=HorL1iie4YQ&feature=youtu.be>

b.      <https://www.youtube.com/watch?v=eODxUsNiRgE>

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## 1353 – Engineering Discovery Days Prep

**Content**

As a lab member, I would like to prep the lab for Engineering Discovery Days: April 21st.

**Definition of Done**

[ ] Decide what exhibits we want (simulators, display aircraft, etc)

[ ] How do we want to present the exhibits?

[ ] Coordinate to move the MFOC to “the option A site” (see notes)

[ ] Solicit volunteers for the lab (see \\FlightOperations\Operations\AFSLFlightOperations\VolunteerSignups\17\_04\_21\_EngineeringDiscoveryDays.docx)

[ ] Review proposed exhibit with Chris and Hannah several weeks before event.

[ ] Assign someone to take photos for AFSL publicity during the event

[ ] Advertise for this event (create an event on Facebook). See notes for picture that can be used

[ ] Do what else it takes to prepare

**Notes**

* Coordinate with Hannah to place MFOC in parking space and run electrical.
* Some ideas of exhibits
  + Fly the Phantom 3 Pro inside a tent next to the MFOC
  + Flight simulators both inside and outside the MFOC
  + Live FPV video from aircraft to MFOC
  + Drive GROVER around
  + Posters
* Pictures from 2016 are located at "K:\AFSL\PicturesAndMedia\16\_04\_22\_discovery\_days"
* See <http://www.engr.washington.edu/future/k12/discoverydays> for more info

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## 1354 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

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## 1355 – MAPSS Prototype 1 Documentation

**Content**

As a MAPSS member, I would like to document the equipment and operations guide for Prototype 1.

**Definition of Done**

[ ] Complete documentation on \MAPSS\Research\Prototypes\MAPSS Prototype 1.docx

[ ] Recommend potential improvements for future prototypes

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## 1356 – MAPSS SONY A5100 Documentation

**Content**

As a MAPSS member, I would like to document the operations guide for the Sony A5100.

**Definition of Done**

[ ] Complete documentation on \MAPSS\Research\Sony a5100\Sony a5100

[ ] Basic procedures (powering/charging, switching modes, accessing images, etc)

[ ] Equipment needed / used

[ ] Useful Settings

[ ] Remote Connection procedure

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## 1357 – Modulation Transfer Function Research & Documentation

**Content**

As a MAPSS member, I would like to research Modulation Transfer Function and document procedures to capture MTF scores and charts.

**Definition of Done**

[ ] Complete documentation on \MAPSS\Research\MTF Research\MTF initial research.docx

[ ] Document MTF score post-processing procedure

[ ] Comparison with MicaSense procedures

[ ] Share results with rest of MAPSS Team

[ ] Create short MTF score section (images/descriptions) for future capstone presentations

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## 1358 – MAPSS Test Card Creation (Part 1)

**Content**

As a MAPSS member, I would like to set up a test card plan for MAPSS flight tests.

**Definition of Done**

[ ] Complete Test Card for Prototype 1

[ ] Combine flight test card with JCATI 2016’s flight test card

[ ] Acceptance at Flight Readiness Review

[ ] Suggesting improvements for future MAPSS Flight Tests

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## 1359 – MAPSS MTF Poster Creation (Part 1)

**Content**

As a MAPSS member, I would like to create a poster for gathering MTF data

**Definition of Done**

[ ] Research appropriate sizing for poster (camera can capture the whole poster from more than 1ft)

[ ] Create poster

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Note: Part 2 is the flight test ready version (larger in scale)

## 1360 – Luke Rebuild

**Content**

As a lab member, I would like to rebuild Luke.

**Definition of Done**

[ ] Analyze the damage and whether it is possible/economical to rebuild Luke

[ ] If not, determine which onboard equipment is reusable

[ ] Determine if it is worth buying a new airframe to continue this line of research

If so, complete the necessary repairs

[ ] Complete hardware integration

[ ] Complete software integration, including parameter settings, Pixhawk calibration

[ ] Troubleshoot and come up with a plan of how to have a successful next flight (talke to Ryan Grimes about Luke post-mortem and how we can avoid the same issue in the future

[ ] Record all changes on Anakin’s construction and modification log

[ ] Make a test card for Luke’s first flight back in action

**Notes:**

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## 1361 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

## 1362 – Perforce Visual Client (copy)

**Content**

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**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

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## 1363 – Perforce Visual Client (copy)

**Content**

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**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

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## 1364 – Indoor Flight Testing Location

**Content**

As a lab member, I would like to investigate indoor flight testing locations for low altitude / ground testing for AFSL projects.

**Definition of Done**

[ ] Investigate nearby indoor flight testing locations

[ ] Determine suitable locations with Hannah

[ ] Email/Call Flight test location for more information

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## 1365 – Cera Build

**Content**

As a UAS operator, I would like to build the Turnigy Talon Tricopter (T3) so I can use it for demonstration purposes as well as research and testing.

**Definition of Done**

[ ] Build the Turnigy Talon Tricopter and make it airworthy. Some subsystem to consider include but are not limited to:

[ ] ESC

[ ] Battery switches

[ ] Pixhawk mini

[ ] Video Tx

[ ] Camera

[ ] Review final product with Chris Lum.

[ ] Come up with a name for the system

[ ] Document all construction in appropriate location.

[ ] Present results to research group.

[ ] Conduct flight tests.

[ ] Additional tasks TBD

**Notes**

* See build notes for MARV.

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## 1366 – Perforce Visual Client (copy)

**Content**

As a software developer, I would like a Perforce client installed on my machine and would like to be comfortable with its use so I may sync files and make code changes.

**Definition of Done**

[x] Read the document \\AFSL\HowToDocumentation\installing\_p4v.docx (contact Chris Lum to obtain this document)

[x] Follow this document’s instructions to install P4V (Perforce Visual Client). You can obtain the binary installation file from <http://faculty.washington.edu/lum/AFSL>.

[x] Attended discussion/training with CL regarding Perforce operation and concepts.

[x] Successfully create and sync relevant workspaces (both documentation and code)

[ ] Successfully check something into the depot

[ ] Practice resolving merge conflicts (artificially create a test file and work with another group member to create a conflict and resolve this). Make a note of the difference between merging a text file vs. a binary file.

[x] Read the document \\AFSL\LabInfo\NewLabMemberOrientation.docx.

[x] Create your folder in the \\UserFiles\ depot

[x] Update your information in the \\AFSL\LabInfo\ContactInfo.xlsx file.

[ ] Add a 150x200 pixel .jpg to \\AFSL\WebsiteInfo\People\.

[ ] Add a brief bio to \\AFSL\WebsiteInfo\People\People.docx.

**Notes**

* Recall that Perforce cannot create individual folders. In order to create a folder on the depot, you may need to use a dummy, placeholder file within a folder. By checking in this dummy file, Perforce will simultaneously create the desired folder.
* You can usually find help from someone in the lab (AERB 139).
* Do NOT check in large data sets or files into Perforce. Once you check something into Perforce, it takes up hard drive space even if you delete it later (remember that Perforce retains all versions of a file).
* If you need to delete a workspace, talk to Chris Lum before attempting this.
* If you have any questions, please ask a more experienced member before making changes.

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## 1370 – Gimbal Trade Study and Mounting for Visual Anchoring (1703)

**Content**

As a developer working on visual anchoring project, I’d like to configure and install the camera gimbal and video transmitter on the CONDOR aircraft (Skywalker 1900).

**Definition of Done**

[X]Research varing types of camera and gimbal setups that have minimum 2 axis control

[X]Design mounting points for 3 axis gimbal under wing and on canopy of Skywalker 1900

[X] Install the camera gimbal and video transmitter on CONDOR (under wing /ensure correct connections)

[X] Configure camera gimbal servo controls using transmitter G and configure Mobius Action camera to transmit video to video receiver and capture card

[X] Conduct test to make sure capture card can receive live footage from the Mobius Action camera

**Notes**

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**1371 – Adapter for new PC power supply for battery charging (1702)**

**Content**

Take new PC power supply provided by Professor Lum and use as power supply for charging. Adapter created to draw requires 12V from power supply to charger using 20 pin connector, as opposed to re-terminating wiring on the power supply wiring itself.

**Definition of Done**

[X] Complete adapter and provide to the lab in the Power/Charging tool box with power supply and charger.

**Notes**

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**1372 – Pixhawk mounting test for vibration dampening (1703)**

**Content**

Design and build a mounting plate for dampening the vibrations of the Pixhawk. Configure for the Skywalker 1900 airframe. Perform vibration test with and without the new mounting plate. Compare results.

**Definition of Done**

[X] Prove design concept of building and mounting pixhawk with mounting plate and dampeners and install in Skywalker 1900.

[X] Prepare for ground test to collect data and prove if design is useful.

**Notes**

* Mounting plate is made of “scrap” carbon fiber composite plate that was made as a sample in the Mechanical Engineering department composite lab. Coordinated with Bill Kuykendall and found out that small pieces of cured composite are often available if we have use for them on projects. The advantage is that they are small, lightweight, strong, flexible or rigid depending on layup and best of all, free. Also coordinated with the ME lab to cut the composite pieces on a wet saw. Water jest would also work well and I know the AA department manufacturing labs have access to that.

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**1373 – Flight Ops Administration (1702)**

**Content**

As flight operations director, I would like to complete the following tasks to administrate flight operations.

**Definition of Done**

[ ] Coordinate and administrate flight tests

**Notes**

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**1374 – JCATI To-do (1702)**

**Content**

As a lab member, I need to complete the following to make progress on the JCATI 2016 project

**Definition of Done**

[ x] Figure out how Noshad’s gui works

[ x] Run SDR GUI

[ x] Update UDP python script

[ x] Coordinate with MAPPS for flight ops planning

[ x] Plan flight ops for script testing

**Notes**

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**1375 – JCATI LLNL Ground Test**

**Content**

As a lab member, I would like to plan and participate in the LLNL ground test on 3/16/17.

**Definition of Done**

[ ] Develop test cards

[ ] Establish test site location

[ ] Run ground test and collect data

[ ] Analyze data

**Notes**

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**1376 – JCATI Poster**

**Content**

As a lab member, I would like to design the JCATI poster.

**Definition of Done**

[ ] Update current poster to match new design C:\dev\JCATI2016\TechnicalDataPackage\ProjectVision\SDRProjectVision.pptx

[ ] Ensure it is ready for JCATI symposium on 4/4

**Notes**

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**1377 – JCATI SDR Integration & Flight Test**

**Content**

As a lab member, I would like to move forward with SDR integration and flight testing.

**Definition of Done**

[ ] Work with FUNLAB to integrate SDR onto Argo

[ ] Plan flight test

[ ] Decide if we need to fly with dummy load first

[ ] Create test cards

[ ] Conduct flight test

[ ] Post flight analysis

**Notes**

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**1378 – LiDAR Procurement**

**Content**

As a lab member, I would like to move forward with with the LiDAR sensor procurement.

**Definition of Done**

[ ] Work with relevant department faculty & staff to put in an order for the LiDAR puck

[ ] Coordinate with STF team

**Notes**

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**1379 – Lab Component Inventory**

**Content**

As a lab member, I would like to inventory all of the electronic UAS components in the lab.

**Definition of Done**

[ ] Go through all the boxes in the lab, especially the RC parts boxes, and add everything relevant to the file located here: \FlightOperations\UAS\ComponentTracker.xlsx

[ ] Also look through orange boxes to see if anything was overlooked

[ ] Work with CONDOR team to make sure CONDOR is inventoried

**Notes**

* Check with Hannah with questions

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**1380 – Clean Scissors**

**Content**

As a lab member, I would like to remove the sticky stuff from all of the scissors in the lab.

**Definition of Done**

[ ] Clean the scissors

[ ] Come up with a way to prevent the sticky from returning

**Notes**

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**1381 – Reorganize Lab’s Airspace**

**Content**

As a lab member, in anticipation of more aircraft being added to the fleet, I would like to reorganize the airspace to better accommodate whate we have, and allow for more aircraft to be added.

**Definition of Done**

[ ] Find a way to fit more aircraft, or at minimum de-clutter what we have by moving the strings around

[ ] Do not hang anything from the sprinkler pipes

**Notes**

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**1382 – Repair GROVER**

**Content**

As a lab member, I would like to repair GROVER so that it is fully functional.

**Definition of Done**

[ ] Fix the wheel that falls off

[ ] Address the FPV servo – does it need fixing or replacing?

[ ] Make sure it can follow an auto path flawlessly and is ready to use for swarm research

[ ] Document Fixes at

\FlightOperations\UAS\GROVER\ConstructionAndMaintenenceLog.docx

**Notes**

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## 1383 – New Swarm Research Ground Vehicle

**Content**

As a lab member, I would like to procure and build a new ground vehicle to be used along with GROVER in swarm research.

**Definition of Done**

[ ] Coordinate with swarm team before beginning this user story

[ ] Based on the swarm requirements, and what has been used in GROVER, research parts/systems that will meet these requirements.

[ ] Work with Hannah Rotta to procure parts for the system.

[ ] Assemble the system and perform preliminary testing.

[ ] Document results including:

[ ] Name system

[ ] Create a file/folder infrastructure in the \\FlightOperations\UAS similar to other systems

[ ] Integrate this system into the list of research platforms available to the AFSL

[ ] Incorportate the [ArduRover](http://rover.ardupilot.com/) firmware running on the [Pixhawk](http://store.3drobotics.com/products/3dr-pixhawk) system and communicating to the [Mission Planner](http://planner.ardupilot.com/) ground station software.

[ ] Create and test Waypoints for Ground Rover use

[ ] Create/Verify Simple “Go from A to B” python script

[ ] Verify rover autonomous systems during a ground test

**Notes**

* This project focuses on constructing an autonomous ground vehicle that can be used as a research platform.
* The system can be based off of the GROVER system but can also have variations as deemed appropriate

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**1384 – Flight Training Program – Multi-Rotor (copy)**

**Content**

Copy of user story 1263 – Flight Training Program – Multi-Rotor

**Definition of Done**

Copy definition of done from user story 1263 – Flight Training Program – Multi-Rotor

**Notes**

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**1385 – Plimp Proposal**

**Content**

As a lab member, I would like to create a funding proposal for Plimp.

**Definition of Done**

[ ] Budget

[ ] Fill in gaps that Dr. Lum did not address

**Notes:**

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**1386 – Master’s Thesis Presentation (Larson) (copy)**

**Content**

As a student, I would like to write my Master’s thesis so I can graduate.

**Definition of Done**

[ ] Polish thesis as necessary

[ ] Present thesis results at department wide meeting/presentation on (date TBD)

[ ] Obtain all necessary signatures and documents required for graduation

**Notes**

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**1387 – JCATI To-do (1702) (Copy)**

**Content**

As a lab member, I need to complete the following to make progress on the JCATI 2016 project

**Definition of Done**

[ x] Figure out how Noshad’s gui works

[ x] Run SDR GUI

[ x] Update UDP python script

[ x] Coordinate with MAPPS for flight ops planning

[ x] Plan flight ops for script testing

**Notes**

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## 1388 – Piksi RTK Flight Test (Copy)

**Content**

As a lab member, I would like to work on setting up the Piksi real time kinematics location system and determine its feasibility for use with the JCATI Project.

**Definition of Done**

[ x] Locate documentation and become familiar with it

[ x] Perform ground tests

[ ] Complete 3d printed mounts and ground plates to minimize interference

[ ] Set up mission planner to accept piksi data

[ ] Complete a flight test

**Notes**

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## 1389 – Cera Build (copy)

**Content**

Copy of user story 1365 – Cera Build story

**Definition of Done**

Copy definition of done from user story 1365 – Cera Build

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**1390 – STF Proposal Part 2**

**Content**

As a student, I would like to work with the STF team to finalize the proposal

**Definition of Done**

[x] Work with STF to finish up last minute proposal questions and presentations

**Notes**

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## 1391 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

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**1392 – Flight Training Program – Multi-Rotor (copy)**

**Content**

Copy of user story 1263 – Flight Training Program – Multi-Rotor

**Definition of Done**

Copy definition of done from user story 1263 – Flight Training Program – Multi-Rotor

**Notes**

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**1393 – Flight Training Program**

**Content**

Copy of user story 1127 – Flight Training Program

**Definition of Done**

Copy definition of done from user story 1127 – Flight Training Program

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**1394 – Flight Training Program**

**Content**

Copy of user story 1127 – Flight Training Program

**Definition of Done**

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**1395 – Flight Training Program – Multi-Rotor (copy)**

**Content**

Copy of user story 1263 – Flight Training Program – Multi-Rotor

**Definition of Done**

Copy definition of done from user story 1263 – Flight Training Program – Multi-Rotor

**Notes**

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**1396 – Flight Training Program – Multi-Rotor (copy)**

**Content**

Copy of user story 1263 – Flight Training Program – Multi-Rotor

**Definition of Done**

Copy definition of done from user story 1263 – Flight Training Program – Multi-Rotor

**Notes**

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**1397 – Flight Training Program – Multi-Rotor (copy)**

**Content**

Copy of user story 1263 – Flight Training Program – Multi-Rotor

**Definition of Done**

Copy definition of done from user story 1263 – Flight Training Program – Multi-Rotor

**Notes**

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## 1398 – VTOL/QuadPlane (copy)

**Content**

Copy of user story 1352 – VTOL/QuadPlane**Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story 1352 – VTOL/QuadPlane

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## 1399 – VTOL/QuadPlane (copy)

**Content**

Copy of user story 1352 – VTOL/QuadPlane**Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story 1352 – VTOL/QuadPlane

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## 1400 – VTOL/QuadPlane (copy)

**Content**

Copy of user story 1352 – VTOL/QuadPlane**Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story 1352 – VTOL/QuadPlane

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## 1401 – Create an AFSL Promo Video for the Website

**Content**

As a lab member, I would like to create a video for the website promoting the lab.

**Definition of Done**

[ ] Shoot additional footage of the lab in action

[ ] Find valuable existing footage

[ ] Compile a short movie to upload to website

[ ] Show to group

[ ] Upload to website (work with Karine Chen)

**Notes**

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## 1402 – Create an AFSL Promo Video for the Website (copy)

**Content**

Copy of user story 1401 – Create an AFSL Promo Video for the Website**Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story 1401 – Create an AFSL Promo Video for the Website

**Notes**

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## 1403 – Create an AFSL Promo Video for the Website (copy)

**Content**

Copy of user story 1401 – Create an AFSL Promo Video for the Website**Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story 1401 – Create an AFSL Promo Video for the Website

**Notes**

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## 1404 – Student Technology Fee Proposal (copy) – LIDAR

**Content**

Copy of user story 479 – Student Technology Fee Proposal

## 1405 – Aircraft Part Familiarization (copy)

**Content**

Copy of user story 1263 – Flight Training Program – Multi-Rotor

As an equipment technician, I would like to learn about each component that is a part of the UAV.

**Definition of Done**

Familiarization with:

[ ] Servos, push rods, and control horns  
[ ] Motor and propeller  
[ ] Pixhawk  
[ ] Pixhawk connections including:

* Telemetry radio
* Power module
* Electronic Speed Controller (ESC)
* Buzzer and its various sounds
* Arm/disarm switch
* GPS
* External USB port
* Airspeed sensor

[ ] Motor and battery safety switches

[ ] LiPO batteries

[ ] Basic FPV apparatuses (i.e. Mobius camera, A/V Transmitter)

**Notes**

## 1418 – BVLOS Waiver

**Content**

As a researcher, I would like apply for a waiver to fly beyond visual line of sight.

**Definition of Done**

[ ] Research waiver requirements \FlightOperations\Operations\COWs\Part107Waiver\_Instructions.pdf and \FlightOperations\Operations\COWs\Part107Waiver\_PerformanceBasedStandards.pdf

[ ] Research what other people have done to get this waiver previously

[ ] Refer to AFSL’s altitude waiver for inspiration \FlightOperations\Operations\COWs\AltitudeWaiver\107W-2016-01765\_51bsigned.pdf

[ ] Ensure our aircraft can meet requirements

[ ] Write waiver

[ ] Ensure waiver is peer reviewed

[ ] Submit

**Notes**

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## 1419 – Aircraft Lights for Altitude Waiver

**Content**

As a lab member, I would like to procure and install the lights necessary to be compliant with the FAA alititude waiver, that will allow our aircraft to be visible from 1 mile away. These will initially be installed on TEDD and Argo.

**Definition of Done**

[ ] Talk to Karine about light research and briefly do your own research to determine the best lights for our aircraft. Some example features we may want:

[ ] High visibility (minimum 1 mile daytime)

[ ] Easily integrated

[ ] Can run off LiPo battery (separate from normal aircraft battery) and stay lit for the duration of one or more flights (minimum 20 minutes)

[ ] Aviation colors – red, white and green (ideal but not a requirement)

[ ] Works for fixed wing and multi-rotor aircraft

[ ] Talk to Hannah about purchasing the lights

[ ] Install on TEDD and Argo

[ ] Write up documentation for use

[ ] Add documentation folder to \FlightOperations\UAS\CommonDocuments\

[ ] Write and integrate operational checklist into current UAS checklists

**Notes**

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## 1420 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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## 1421 – Research Mission Planner

**Content**

As a lab member, I would like to research how to create executable python scripts in Mission planner and how to create custom parameter and flights modes.

**Definition of Done**

[ ] Develop pythons script that can send UDP packets to MatLAB

[ ] Develop a custom version of mission planner with at least one custom parameter and flight mode

**Notes**

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**1422 – Flight Training Program – Multi-Rotor (part 1)**

**Content**

As a future sUAS pilot, I would like to complete the AFSL required training to become eligible to fly the lab’s multi-rotor aircraft.

**Definition of Done**

[x ] Before anything else, read the training information located here: **\FlightOperations\Operators\Training\FlightTrainingInformation.docx**

[ ] Log at least three hours of productive simulator time on PhoenixRC on the computer nearest the door. Please use a multi-rotor model. Additional time may be spent on other airframes, but a minimum three hours on a multi-rotor are required. This includes the following:

[ ] Log at least three hours here in the gray section of this document: **\FlightOperations\Operators\Training\FlightTrainingRecords.xlsx**

[ ] Practice takeoffs

[ ] Practice hovering/loitering and other basic maneuvers

[ ] Practice reverse orientation flying

[ ] Perform 15 safe landings on a Dead Calm day (weather can be adjusted in the settings)

[ ] Perform 15 safe landings on a Brisk day

[ ] Perform 15 safe landings on a Fair Wind day

[ ] Demonstrate to a lead pilot proficiency on takeoff, cruise, reverse orientation and landing

**1423 – RF Spectrum Analyzer Manual**

**Content**

As a lab member, I would like to complete the user story on the weather station and complete the manual for the RF spectrum analyzer, which has now been found.

**Definition of Done**

[x] Locate the RF Spectrum Analyzer  
[x] Write an AFSL Publication detailing the standard operation of the RF Spectrum Analyzer  
[x] Update the AFSL Publication Numbers document

## 1424 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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## 1425 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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## 1426 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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## 1427 – Auto Takeoff

**Content**

As a lab member, I would like to research how to have our fixed wing aircraft perform auto takeoffs.

**Definition of Done**

[ ] Research what is required to perform an auto takeoff. This could include researching what other people do, what capabilities Mission Planner has for this, and what on-board technology the aircraft needs.

[ ] What parameters need to be set in ArduPlane?

[ ] What waypoints/commands need to be set in Mission Planner?

[ ] Does the PIC have any control authority during auto takeoff? Or do they need to switch out of auto mode if they need to “nudge” the plane one way or another?

[ ] What happens if you lose comms or otherwise experience an emergency during auto takeoff?

[ ] Draft a test card to experiment with this system on Anakin.

[ ] Determine if auto takeoffs will increase safety, success and/or ease of flight during our operations. Baically, is this better than taking off in manual/stabilize then switching over to auto once we’ve reached altitude?

[ ] Present findings to research group.

**Notes**

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## 1428 – Auto Landing

**Content**

As a lab member, I would like to research how to have our fixed wing aircraft perform auto landings. I will confer with the development champion of user story 1427 – Auto Takeoff to glean relevant info from what they learned.

**Definition of Done**

[ ] Research what is required to perform an auto landing. This could include researching what other people do, what capabilities Mission Planner has for this, and what on-board technology the aircraft needs.

[ ] What parameters need to be set in ArduPlane?

[ ] What waypoints/commands need to be set in Mission Planner?

[ ] Does the PIC have any control authority during auto landing? Or do they need to switch out of auto mode if they need to “nudge” the plane one way or another?

[ ] What happens if you lose comms or otherwise experience an emergency during auto landing?

[ ] Draft a test card to experiment with this system on Anakin if this is something we can accommodate.

[ ] Determine if auto landings will increase safety, success and/or ease of flight during our operations. Baically, is this better than landing in manual/stabilize then switching over to auto once we’ve reached altitude?

[ ] Present findings to research group.

**Notes**

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## 1429 – DJI Phantom 3 Usage Study

**Content**

As a lab member, I would like to research whether or not the DJI Phantom 3 is a viable platform for our lab’s operations.

**Definition of Done**

[ ] Research the basics of the DJI Phantom 3 and determine

[ ] What is its payload capacity?

[ ] Can you generate flight paths offline (i.e. in the lab then upload them later)?

[ ] Can the default camera be used for creating geo-tagged images?

[ ] Can the default gimbal be removed and can we mount another camera on it (such as the RedEdge)?

[ ] How might AFSL use the Phantom for research?

[ ] Is this a viable platform for AFSL? Is it better or worse than what we have, or a good alternative?

[ ] Present findings to research group.

**Notes**

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## 1430 – GCS and Aircraft Software/Firmware Upgrades

**Content**

As a lab member, I would like to investigate upgrading our Mission Planner and ArduCopter/Plane/Rover software across the fleet.

**Definition of Done**

[ ] Research what has changed between the software we are using and the newer versions by reading online release notes and documentation

[ ] Utilize the upgraded version of Mission Planner installed on AFSLCondor (WARNING: do not write over or delete the old versions)

[ ] If valuable, write a test card and complete flight using new version of Mission Planner before moving on to the firmware upgrades

[ ] Upgrade Anakin’s ArduPlane

[ ] Compare how the parameters change between versions. You can use Perforce’s “Diff Against” feature to do this.

[ ] Determine if any of the parameters need adjusting to be functional

[ ] Write a few test cards so that we can do a few shakedown flight tests to ensure everything operates normally and safely before rolling this out on all of our systems.

[ ] We may want to do a similar trial and shakedown with MARV and GROVER before introducing the upgraded software to the other multi-rotors and rover. You should determine if this is necessary. If so, then do it.

[ ] Collect data flash and tlog data from the new firmware. Ensure that these files are consumable but the UWMatlab software (in other words, generate test data and run \\FlightOperations\Operations\Missions\MASTER\DataAnalysis\MAIN\_data\_analysis.m )

[ ] Check if Pixhawk Minis are supported with new Mission Planner and/or ArduPlane/Copter/Rover

[ ] Look it up

[ ] Try connecting Cera

**Notes**

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**1431 – New Swarm Research Ground Vehicle (copy)**

**Content**

Copy of user story 1383 – New Swarm Research Ground Vehicle

**Definition of Done**

Copy definition of done from user story 1383 – New Swarm Research Ground Vehicle

**Notes**

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**1432 – New Swarm Research Ground Vehicle (copy)**

**Content**

Copy of user story 1383 – New Swarm Research Ground Vehicle

**Definition of Done**

Copy definition of done from user story 1383 – New Swarm Research Ground Vehicle

**Notes**

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**1433 – New Swarm Research Ground Vehicle (copy)**

**Content**

Copy of user story 1383 – New Swarm Research Ground Vehicle

**Definition of Done**

Copy definition of done from user story 1383 – New Swarm Research Ground Vehicle

**Notes**

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## 1434 – Multi-Rotor Training Document

**Content**

As a multi-rotor pilot, I would like to write up the documentation necessary for someone brand new to have an introduction to multi-rotor training and flying.

**Definition of Done**

[ ] Write a comprehensive document that outlines all aspects of flying a multi-rotor aircraft, similar to the fixed wing document: \FlightOperations\Operators\Training\FlightTrainingInformation.docx. Should fixed wing and multi-rotor be on the same, or separate documents?

[ ] This should be written such that someone who knows nothing prior, can read it and have all (or at least most of) the knowledge necessary that with simulator time and in person training in the field, they will be a proficient multi-rotor pilot.

[ ] Include must know items, valuable tips and tricks and other useful commentary.

**Notes**

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## 1435 – Self-Contained FPV Research

**Content**

As a lab member, I would like to research the feasibility of using self-contained FPV systems on our aircraft. These systems would merely need to be mounted/taped to an aircraft, and connected to power.

**Definition of Done**

[ ] Find various examples of purchaseable self-contained FPV systems.

[ ] Create a spreadsheet comparing these systems, and our current FPV gear. Relevant fields include:

* cost
* resolution
* power requirements
* transmission range
* transmission technology and frequency
* special applications and features

[ ] Present findings to the lab.

**Notes**

## 1436 – MAPSS Vibration Sensor Acquisition and Testing

**Content**

As a MAPSS member, I would like to purchase and test the use of a vibration sensor for collection in-flight vibration data.

**Definition of Done**

[ ] Find various Vibration Sensors online to purchase

[ ] Purchase Vibration Sensor

[ ] Document Vibration Sensor

[ ] Test the Vibration Sensor

[ ] Show results to MAPSS members

**Notes**

Ask Spenser or Fiona for advice if need be.

## 1437 – MAPSS Shaker Table Testing (Part 1)

**Content**

As a MAPSS member, I would like to use the AA shaker table to produce high-level trade studies regarding the dampening plate design (eg number & layout of rubber balls).

**Definition of Done**

[ ] Create appropriate “test cards” for desired Shaker Table Tests

[ ] Research Shaker Table Interface

[ ] Manufacture dampening plate designs

[ ] Schedule time to conduct tests (Contact Professor Yang)

[ ] Test and clean up properly

[ ] Present results to MAPSS members

**Notes**

## 1438 – MAPSS Gimbal Structural Component Research

**Content**

As a MAPSS member, I would like to research the effectiveness of gimbal components (L-brackets / rods / bent plates) , for use in design components.

**Definition of Done**

[ ] Research gimbal components

[ ] Determine important characteristics and best uses/designs

[ ] Present results to MAPSS members

**Notes**

## 1439 – MAPSS FLIR VUE Plate Design

**Content**

As a MAPSS member, I would like to design the FLIR VUE plate for integrating this camera system into the camera payload plate

**Definition of Done**

[ ] Design FLIR VUE plate via Solidworks

[ ] Save as DXF file for manufacturing

[ ] Upload to Perforce

**Notes**

## 1440 – MAPSS FLIR VUE Plate Manufacturing

**Content**

As a MAPSS member, I would like to manufacture the integration plate for the FLIR VUE.

**Definition of Done**

[ ] Work with member responsible for 1439 – MAPSS FLIR VUE Plate Design

[ ] Oversee manufacturing of plate

[ ] Document manufacturing procedure (w/ pictures/video)

[ ] Assemble FLIR VUE integration

[ ] Present Results to group

**Notes**

## 1441 – MAPSS Prototype 2 Reconstruction

**Content**

As a MAPSS member, I would like to reconstruct Prototype 2 for the next flight test.

**Definition of Done**

[ ] Choose reconstruction option (L-Brackets or different material)

[ ] Gather Supplies needed to reconstruct P2

[ ] Manufacture P2

[ ] Document manufacturing process / assembly (Pictures/Videos)

[ ] Show results to MAPSS group

**Notes**

## 1442 – MAPSS Camera Payload Plate Final Design

**Content**

As a MAPSS member, I would like to finalize the design of the camera payload plate.

**Definition of Done**

[ ] Design plate in Solidworks

[ ] Verify plate design with rest of MAPSS team

[ ] Manufacture Plate

[ ] Document manufacturing methods (Pictures / Video)

**Notes**

## 1443 – MAPSS FLIR VUE model reprint/reweigh

**Content**

As a MAPSS member, I would like to reprint/reweigh Flir Vue model

**Definition of Done**

[ ] Modify manufacturing procedure / Add weight to the model

[ ] Weight the model

**Notes**

## 1444 – MAPSS Flight Test Readiness

**Content**

As a MAPSS member, I would like to be responsible for MAPSS Flight Testing and updating flight cards.

**Definition of Done**

[ ] Talk with Hannah for upcoming flight test dates

[ ] Prioritize flight test preparation and readiness

[ ] Talk with Zach Williams as a designated pilot for weekday flight tests

[ ] Update and manage flight test cards for gathering the most amount of data

**Notes**

## 1445 – MAPSS Carbon Fiber Supply

**Content**

As a MAPSS member, I would like to be responsible for MAPSS Carbon fiber supply for future manufacturing.

**Definition of Done**

[ ] Research ARIBA companies for carbon fiber supplies

[ ] Purchase plates

**Notes**

## 1446 – MAPSS Electrical System Research

**Content**

As a MAPSS member, I would like to be responsible for researching electrical integration for the MAPSS cameras and gimbal controller.

**Definition of Done**

[ ] Research voltages needed to run each component

[ ] Research voltage output by battery (battery drain estimates)

[ ] Research / purchase electrical components necessary

[ ] Test setup WITHOUT components

[ ] Verify setup before continuing

[ ] Test setup WITH components

**Notes**

## 1447 – MAPSS Prototype 3 Design

**Content**

As a MAPSS member, I would like to be responsible for designing MAPSS Prototype 3

**Definition of Done**

[ ] Choose best practices for integrating structure

[ ] Design parts in Solidworks

[ ] Verify design with teammates

**Notes**

Remember to prioritize weight, size, and manufacturability

P3 Manufacturing starts 1st week of spring quarter

## 1448 – MAPSS Prototype 3 Design (copy)

**Content**

Copy of 1447 – MAPSS Prototype 3 Design

## 1449 – MAPSS Prototype 3 Design (copy)

**Content**

Copy of 1447 – MAPSS Prototype 3 Design

## 1450 – MAPSS Prototype 3 Design (copy)

**Content**

Copy of 1447 – MAPSS Prototype 3 Design

## 1451 – MAPSS Camera Payload Plate Final Design (copy)

**Content**

Copy of 1442 – MAPSS Camera Payload Plate Final Design

## 1452 – MAPSS Prototype 2 Design and Construction

**Content**

As a MAPSS member, I would like to be responsible for designing/manufacturing MAPSS Prototype 2

**Definition of Done**

[ ] Choose best practices for integrating structure

[ ] Design parts in Solidworks

[ ] Verify design with teammates

[ ] Construct components

[ ] Assemble Prototype 2

**Notes**

Proof of concept prototype

* Will need to be reconstructed due to wear on Aluminum 6061 bends

## 1453 – MAPSS Prototype 2 Design and Construction (copy)

Copy of 1452 – MAPSS Prototype 2 Design and Construction

## 1454 – MAPSS Prototype 2 Design and Construction (copy)

Copy of 1452 – MAPSS Prototype 2 Design and Construction

## 1455 – MAPSS Prototype 2 Design and Construction (copy)

Copy of 1452 – MAPSS Prototype 2 Design and Construction

## 1456 – Social Media Updates (copy) – SPR ’17

**Content**

Copy of user story 1082 – Social Media Updates

As a lab member, I would like to update the activities of the lab for publicity on the AFSL website, Facebook, and YouTube pages.

**Definition of Done**

[ ] Consult with Chris Lum on the activity’s description and prospective posting photos/videos.

[ ] Frequently post profiles of lab members and their specific involvement in the lab on Facebook.

For every post-flight test:

[ ] Upload selected videos from the flight test onto YouTube.

[ ] Update the video description (follow the template on YouTube)

[ ] Make sure each video tag includes: university of washington autonomous flight systems laboratory uw afsl test (schoolyear e.g. 20162017) (date e.g. 20161119) (location e.g. meadowbrooke farm) (UAS e.g. tedd) run (run# e.g. 001) (title)

[ ] everything is in lowercase

[ ] every word has a space in between

[ ] exclude all the parenthesis

[ ] Make sure the uploaded videos are included in their perspective playlists (it is possible for each video to be in more than one playlist)

[ ] Share the videos uploaded onto YouTube on Facebook.

[ ] Upload selected photos from the flight test onto Facebook.

[ ] Confirm that the photos and videos from each flight test are uploaded onto K drive.

Flight Test:

[ ] “Date (e.g. 20161126)” @ “Location (e.g. Meadowbrooke Farm)”

[ ] “Date (e.g. 20161126)” @ “Location (e.g. Meadowbrooke Farm)”

[ ] “Date (e.g. 20161126)” @ “Location (e.g. Meadowbrooke Farm)”

[ ] Include every additional Flight Test from this quarter here…

[ ] At the end of the quarter, please make a new copy user story 1082 – Social Media Updates for the next quarter.

**Notes**

* This is a quarter long commitment, please only pick it up if you can make the time.
* Every flight test for the quarter is to be included under Flight Test.
* Every video and photo needs to be in its best quality, meaning the videos are to be trimmed, and photos to be cropped if deemed necessary.
* Uploaded videos are automatically distributed into its perspective playlists if tagged correctly.
* Uploaded videos will automatically be shared through Twitter.
* Q&A about video tag: “school year (e.g. 20162017)” is considered from first day of summer courses of that year to the day before the first day of summer courses for the following year.
* **This is the original UserStory [Read-Only], please make a copy it of this at the end of every quarter. Delete this note in the new copy.**

**1457 – Flight Training Program – Multi-Rotor (copy)**

**Content**

Copy of user story 1263 – Flight Training Program – Multi-Rotor

**Definition of Done**

Copy definition of done from user story 1263 – Flight Training Program – Multi-Rotor

**Notes**

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**1458 – Flight Training Program**

**Content**

Copy of user story 1127 – Flight Training Program

**Definition of Done**

Copy definition of done from user story 1127 – Flight Training Program

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## 1459 – Troubleshoot CERES (Part 2)

**Content**

As a lab member, I would like to troubleshoot the high servo latency and make CERES airworthy again.

**Definition of Done**

[ ] Troubleshoot why CERES’ servos are not responsive

[ ] Fix the problem

[ ] Make sure CERES is airworthy again

**Notes:**

From 12/17/16 mission notes:

Ceres not airworthy. Need to troubleshoot the high latency between the receiver and the AC. It is not responding to the commands smoothly or immediately. GCS received “NO RC Receiver” warning intermittently during the preflight checks

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## 1460 – 3DR Solo Usage Study

**Content**

As a lab member, I would like to research whether or not the 3DR Solo is a viable platform for our lab’s operations.

**Definition of Done**

[ ] Research the basics of the 3DR Solo and determine

[ ] What is its payload capacity?

[ ] Can you generate flight paths offline (i.e. in the lab then upload them later)?

[ ] Can the default camera be used for creating geo-tagged images?

[ ] Can we mount equipment on the bottom of it easily?

[ ] How might AFSL use the Solo for research?

[ ] Is this a viable platform for AFSL? Is it better or worse than what we have, or a good alternative?

[ ] Present findings to research group.

**Notes**

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**1461 – Master’s Thesis Polishing (Larson) (copy)**

**Content**

As a student, I would like to write my Master’s thesis so I can graduate.

**Definition of Done**

[ ] Revise thesis rough draft per comments from committee members.

[ ] Clean up figures, double check calculations, verify correct citations, etc.

**Notes**

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**1462 – AIAA SciTech Conference Paper Draft Writing (copy)**

**Content**

As a student, I would like to summarize my research in a conference paper submission while working on relevant sections of my thesis so I can graduate

**Definition of Done**

[ ] Write relevant sections of thesis to be added to conference paper

[ ] Ensure mathematical modeling for estimators is sound within flight tracking context

**Notes**

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## 1463 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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## 1464 – Auto Takeoff (copy)

**Content**

Copy of user story 1427 – Auto Takeoff

**Definition of Done**

Copy definition of done from user story 1427 – Auto Takeoff

**Notes**

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## 1465 - MAPSS File Uploading

**Content**

As a MAPSS member, I would like to upload and continually maintain MAPSS files onto Perforce.

**Definition of Done**

[ ] Upload all files onto Perforce

[ ] Maintain MAPSS file maintanence on Perforce

**Notes**

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## 1466 – MAPSS MTF Poster Creation (Part 2)

**Content**

As a MAPSS member, I would like to create a poster for gathering MTF data

**Definition of Done**

[ ] Create squares to gather MTF data from

[ ] Create Background for MTF testing using thermal imaging

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## 1467 – MAPSS Prototype 4 Design and Construction

**Content**

As a MAPSS member, I would like to be responsible for designing/manufacturing MAPSS Prototype 4

**Definition of Done**

[ ] Choose best practices for integrating structure

[ ] Design parts in Solidworks

[ ] Verify design with teammates

[ ] Construct components

[ ] Assemble Prototype 4

**Notes**

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## 1468 – MAPSS Prototype 4 Design and Construction (copy)

Copy of 1467 – MAPSS Prototype 4 Design and Construction

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## 1469 – MAPSS Prototype 4 Design and Construction (copy)

Copy of 1467 – MAPSS Prototype 4 Design and Construction

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## 1470 – MAPSS Prototype 4 Design and Construction (copy)

Copy of 1467 – MAPSS Prototype 4 Design and Construction

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## 1471 – MAPSS Manufacturability Trade Study

**Content**

As a MAPSS member, I would like to be responsible for researching available methods of manufacturing our gimbal components.

**Definition of Done**

[ ] Researching different manufacturing methods to create gimbal components

[ ] Research viable locations to acquire materials and perform manufacturing

**Notes**

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## 1472 – MAPSS Manufacturability Trade Study (copy)

Copy of 1471 – MAPSS Prototype 4 Design and Construction

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## 1473 – Part 107 Test Preparation (copy)

**Content**

Copy of user story 1352 – VTOL/QuadPlane**Error! Reference source not found.**

As a researcher, I would like to prepare for and take the FAA Part 107 Commercial Remote Pilot Certification test.

**Definition of Done**

[] Take the online course offered by the FAA

[] Take the three practice tests on the network drive

[] Study all topics identified as weak when taking practice tests

[] Take the part 107 test

[] Do the paperwork to get the license from the FAA

[] Do the paperwork to get reimbursed for test

**Notes**

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**1474 – CONDOR Post-Mortem Analysis**

(Copy of 1168)

**Content**

As lab member, I would like to conduct a CONDOR post-mortem analysis to determine what the cause of failure was.

**Definition of Done**

[ ] Systematically determine what went wrong

[ ] Investigate each part to see if it is working properly

* + be sure to mark broken ones on inventory log: \FlightOperations\UAS\ComponentTracker.xlsx

[ ] Investigate the data logs for clues

[ ] Release back into circulation any components that are working and undamaged

[ ] Report to stakeholders of findings so crash isn’t repeated

**Notes**

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## 1475 – Aircraft Lights Preliminary Integration (Ben)

**Content**

As a lab member, I would like to integrate lights onto Ben for testing.

**Definition of Done**

[x] Coordinate with Chris Lum before starting this user story.

[x] Research the lights to be integrated that is approved by the altitude waiver.

[x] Integrate navigational lights on Ben.

[x] Integrate strobe light on Ben.

[ ] Test fly Ben at a flight test and discuss results.

**Notes**

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## 1476 – Request a Waiver for sUAS – BVLOS

**Content**

As a lab member, I would like to request a waiver for sUAS with the FAA so that I can increase the radius of the flight beyond visual line of sight of 3 miles.

**Definition of Done**

[x] Coordinate with Chris Lum before starting this user story.

[x] Read the form instructions (\FlightOperations\Research\FAA\instructions.pdf) and  the [list of regulations subject to waiver](https://www.faa.gov/uas/beyond_the_basics/#waiver) prior to filling the online form.

[x] Filling the online form that is located at <https://www.faa.gov/uas/request_waiver/>.

[ ] Discuss the drafted form with lab members before submitting.

[ ] Submit the revised form.

**Notes**

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## 1477 – Request a Waiver for sUAS – Swarm

**Content**

As a lab member, I would like to request a waiver for sUAS with the FAA so that I can increase the radius of the flight beyond visual line of sight of 3 miles.

**Definition of Done**

[x] Coordinate with Chris Lum before starting this user story.

[x] Read the form instructions (\FlightOperations\Research\FAA\instructions.pdf) and  the [list of regulations subject to waiver](https://www.faa.gov/uas/beyond_the_basics/#waiver) prior to filling the online form.

[x] Filling the online form that is located at <https://www.faa.gov/uas/request_waiver/>.

[ ] Discuss the drafted form with lab members before submitting.

[ ] Submit the revised form.

**Notes**

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## 1478 – JCATI Pitch & Symposium

**Content**

As a lab member, I would like to prepare a script for the JCATI pitch competition and build a single powerpoint slide

**Definition of Done**

[ ] Create the powerpoint slidie

[ ] Complete edits for the slide

[ ] Write the script for the competition

[ ] Practice delivering the pitch at lab group meeting

[ ] Man the poster at the symposium

**Notes**

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## 1479 – JCATI Pitch & Symposium (copy)

**Content**

As a lab member, I would like to prepare a script for the JCATI pitch competition and build a single powerpoint slide

**Definition of Done**

[ ] Create the powerpoint slidie

[ ] Complete edits for the slide

[ ] Help write the script for the competition

[ ] Man the poster during the symposium

**Notes**

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## 1480 – JCATI Flight Test I

**Content**

As a lab member, I would like to prepare a script for the JCATI pitch competition and build a single powerpoint slide

**Definition of Done**

[ ] Install the new power module to build a model for battery drain

[ ] Map channel 7 to AUX 6 and wire AUX 6 to the raspberry pi

[ ] Finalize waypoint files

[ ] Double check that software is operational

[ ] Organize how data will be collected

[ ] Execute the flight test (weather permitting)

**Notes**

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## 1481 – JCATI Flight Test I (copy)

**Content**

As a lab member, I would like to prepare a script for the JCATI pitch competition and build a single powerpoint slide

**Definition of Done**

[ ] Install the new power module to build a model for battery drain

[ ] Map channel 7 to AUX 6 and wire AUX 6 to the raspberry pi

[ ] Finalize waypoint files

[ ] Double check that software is operational

[ ] Organize how data will be collected

[ ] Execute the flight test (weather permitting)

**Notes**

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## 1482 – Equipment Verification

**Content**

As an equipment technician, I would like to ensure that the telemetry radios used on the aircraft are standardized.

**Definition of Done**

[ ] Ensure the 3DR radios (ONLY the knock-off brand radios) are of the correct gender to communicate with the GCS  
[ ] Ensure Pixhawk contains microSD card

**Notes**

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## 1483 – AIAA SciTech Paper JCATI2016

**Content**

As a JCATI2016 team member, I would like to summarize my research in a conference paper submission.

**Definition of Done**

[ ] Write relevant sections paper, as assigned in the outline

**Notes**

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**1484 – AIAA SciTech Paper JCATI2016 (copy)**

**Content**

Copy of user story 1483 – AIAA SciTech Paper JCATI2016

**Definition of Done**

Copy definition of done from user story 1483 – AIAA SciTech Paper JCATI2016

**Notes**

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**1485 – AIAA SciTech Paper JCATI2016 (copy)**

**Content**

Copy of user story 1483 – AIAA SciTech Paper JCATI2016

**Definition of Done**

Copy definition of done from user story 1483 – AIAA SciTech Paper JCATI2016

**Notes**

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## 1486 – Publishing JCATI Data Online

**Content**

As a member of the JCATI 2016 team, I would like to look into posting the JCATI data to a public website.

**Definition of Done**

[ ] Figure out how to host this on the AFSL website

[ ] Does it need to link to something like the K drive, or Azure?

**Notes**

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## 1487 – Research New Pixhawks

**Content**

As a lab member, I would like to research where we can purchase a replacement for the 3DR Pixhawk.

**Definition of Done**

[ ] Look for the best replacement for the 3DR Pixhawk (3DR is getting out of the manufacturing of small electronics, but there are knockoff brands out there)

[ ] Consider HobbyKing for options, but also look elsewhere

[ ] Is there something better than the Pixhawk?

[ ] Find the best place to also purchase a Pixhawk 2

**Notes**

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**1488 – Flight Training Program (copy)**

**Content**

Copy of user story 1127 – Flight Training Program

**Definition of Done**

Copy definition of done from user story 1127 – Flight Training Program

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## 1489 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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## 1490 – Investigate INEXA

**Content**

As a lab member, I would like to investigate using Insitu’s INEXA as a GCS.

**Definition of Done**

[ ] TBD

**Notes**

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## 1491 – Updating AIAA Conference Paper (Position 1)

**Content**

As a lab member, I would like to complete edits on the AIAA AVIATION paper for the final submission.

**Definition of Done**

[ ] Update old ADS-B and LAMS plots

[ ] Ensure figure labels and plots make sense with the new plots

[ ] Ensure the results section is complete

[ ] Update color scheme for flight path (located in Conference paper 2) figures

[ ] Meet with Dr. Lum to work out any other details that need to be discussed in paper

**Notes**

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## 1492 – LiDAR Software Procurement

**Content**

As a lab member, I would like to research software options to use with the LiDAR hardware.

**Definition of Done**

[ ] Research existing options and what other people have used

[ ] Talk to Karine for resources

[ ] Procure the necessary software after discussing with Chris Lum

**Notes**

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## 1493 – MATLAB for ArduCopter Battery Info

**Content**

As a lab member, I would like to edit the MATLAB code for running arducopter data flash logs such that it properly displays the current and voltage data.

**Definition of Done**

[ ] Fix MATLAB code so that it plots the current and voltage data for arducopter.

**Notes**

* Specifically we need it for Argo.
* You can use the arduplane code for a reference

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**1494 – Flight Ops Administration (1703)**

**Content**

As flight operations director, I would like to complete the following tasks to administrate flight operations.

**Definition of Done**

[ ] Coordinate and administrate flight tests

[ ] Coordinate and administrate ground tests

[ ] Coordinate flight training

[ ] Other administrative stuff

**Notes**

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**1495 – Donated Drone Investigation**

**Content**

As lab member, I would like to look into the new, donated drone and figure out what we can do with it.

**Definition of Done**

[ ] Unpack box

[ ] What is required to put it together?

[ ] Figure out what we want to do with it.

[ ] Either put it in storage, or put it together

**Notes**

* Depending on what we decide to do with it, this user story could be a L or XL

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**1496 – JCATI 1703 Tasks**

**Content**

As lab member working on the JCATI 2016 project, I’d like to make progress on the SDR integration.

**Definition of Done**

[ ] Work with Abhinav to resolve GPS timing issues

[ ] Plan flight tests

[ ] Assorted tasks throughout the month

**Notes**

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**1497 – DJI Phantom 3 MicaSense Mount**

**Content**

As lab member, I would like to create a MicaSense RedEdge mount for the DJI Phantom 3 Professional.

**Definition of Done**

[x] Draft ideas for a bottom-mounted RedEdge mount

[x] Lasercut or 3D print the idea

[x] Perform an indoor test flight and verify that the DJI Phantom 3 Professional can handle the internal weight.

[x] Weigh the added mass to the DJI Phantom 4 Professional

[ ] Perform an outdoor test flight and verify that the DJI Phantom 4 Professional can complete a predetermined circuit

**Notes**

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**1498 – Solder AA Battery Housing**

**Content**

As lab member, I would like to solder connectors to the AA battery pack.

**Definition of Done**

[ ] Find appropriate connectors

[ ] Solder AA battery packs

**Notes**

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**1499 – Turnigy 9X Buddy Box**

**Content**

As lab member, I would like to figure out how to make the buddy boxing work with the Turnigy 9X transmitter.

**Definition of Done**

[ ] Research how to make the buddy boxing work online or see if there is documentation on perforce

[ ] Get buddy boxing working on GROVER

**Notes**

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**1500 – Checklist Formatting**

**Content**

As lab member, I would like to convert our word doc checklists into excel.

**Definition of Done**

[ ] Figure out the best way to move our checklists into excel to make them easier to work with

[ ] Check with Hannah once you have an idea and get it approved

[ ] Convert all checklists

**Notes**

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**1501 – Archiving UAS Articles**

**Content**

As lab member, I would like to archive UAS articles from online.

**Definition of Done**

[ ] Do as Dr. Lum instructed

**Notes**

* See Chris Lum for details

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## 1502 – GCS and Aircraft Software/Firmware Upgrades Part 2

**Content**

As a lab member, I would like to investigate upgrading our Mission Planner and ArduCopter/Plane/Rover software across the fleet.

**Definition of Done**

[ ] Research what has changed between the software we are using and the newer versions by reading online release notes and documentation. These version upgrades are:

[ ] Mission Planner version 1.3.38 to 1.3.45

[ ] ArduPlane version 3.6.0 to 3.7.1

[ ] ArduCopter version 3.3.4 to 3.4.6

[ ] ArduRover version 2.5 to 3.1.2

[ ] Utilize the upgraded version of Mission Planner installed on AFSLCondor if useful (WARNING: do not write over or delete the old versions)

[ ] If valuable, you can upload the new ArduPlane firmware onto Anakin and compare how the parameters change between versions. You can use Perforce’s “Diff Against” feature to do this.

[ ] Determine if any of the parameters need adjusting to be functional

[ ] Check if Pixhawk Minis are supported with new Mission Planner and/or ArduPlane/Copter/Rover

[ ] Look it up

[ ] Try connecting Cera

**Notes**

* Talk to Hannah Rotta with questions
* For potentially helpful documentation see:
  + //VisualAnchoring/TechnicalDataPackage/MissionPlannerModification/MissionPlannerBuildNotes.docx
  + //VisualAnchoring/TechnicalDataPackage/ArduplaneModification/ArduplaneBuildNotes.docx

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## 1503 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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**1504 – Setup GPS Repeater**

**Content**

As lab member, I would like to setup our GPS repeater so that the lab can connect to GPS inside

**Definition of Done**

[ ] Set up and verify functionality

**Notes**

* See Chris Lum for details

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## 1505 – SAM Rebuild (copy)

**Content**

Copy of user story 1226 – SAM Rebuild

**Definition of Done**

Copy definition of done from user story 1226 – SAM Rebuild

**Notes**

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**1506 – Test Location Viewing**

**Content**

As lab member, I would like to head to a potential flight location.

**Definition of Done**

[x] Talk to Dr.Lum before heading out to potential flight locations.

[x] Meet and greet at SRAC Field.

[x] Meet and greet at Carnation Farm.

[x] Relay information to Dr. Lum

**Notes**

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**1507 – Test Location Viewing (copy)**

**Content**

Copy of user story 1507 – Test Location Viewing

**Definition of Done**

Copy definition of done from user story 1507 – Test Location Viewing

**Notes**

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**1508 – Standardize Failsafes**

**Content**

As lab member, I would like to standardize the failsafe parameters across the fleet.

**Definition of Done**

[ ] Determine the best settings for the failsafe parameters. This includes, but is not limited to:

                [ ] Loss of GCS connection

                [ ] Loss of RC connection

[ ] Make sure these changes are reflected across the fleet

[ ] Build a How-to document and upload to //AFSL/HowToDocumentation

**Notes**

* We have had enough sudden crashes of aircraft that it is extrememly important that we determine the best settings for when certain failsafes will trigger, and what they do when they are triggered. It is also important for this to be consistent across our fleet so that we know what to expect if something does go wrong.

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**1509 – Headset Repair**

**Content**

As lab member, I would like to make something to cushon the head piece of the headset that is missing the piece.

**Definition of Done**

[ ] Either 3D print, or make something else that will make the headset confortable to wear

**Notes**

* TBD

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**1510 – Fix and Organize the Battery Box**

**Content**

As lab member, I would like to fix and organize the black battery storage box.

**Definition of Done**

[ ] Retape the compartment walls so that they stay up

[ ] Ensure all the batteries are in their proper sections

**Notes**

* See Hannah Rotta for details

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**1511 – Luke Rebuild (copy)**

**Content**

Copy of user story 1360 – Luke Rebuild

**Definition of Done**

Copy definition of done from user story 1360 – Luke Rebuild

**Notes**

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## 1512 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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## 1513 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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**User Stories**

This is used to document the various user stories associated with various projects within the Autonomous Flight Systems Laboratory.

Note that older user stories are described in other documents (for example user\_stories\_0001\_to\_1000.docx)

Note: Only add user stories if you are experienced with the system. Please see Christopher Lum if you have questions.

Table : Table showing user story sizing and estimated hours for each

|  |  |  |  |
| --- | --- | --- | --- |
| **Size** | **Points** | **Estimated Hours** | **Comment** |
| XS | 1 | 5 | a few hours |
| S | 2 | 10 | a few days |
| M | 3 | 15 | over a week |
| L | 5 | 25 | a few weeks |
| XL | 8 | 40 | takes entire sprint (4 weeks) |

## 1001 – Meadowbrook Flight Test

**Content**

As a member of the CERES team, I would like to test the CERES system in Dempsey Indoor.

**Definition of Done**

[ ] Participate in the Meadowbrook Indoor Flight Test on May 14th, 2016.

**Notes**

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## 1002 – Meadowbrook Flight Test

**Content**

As a member of the CERES team, I would like to test the CERES system in Dempsey Indoor.

**Definition of Done**

[ ] Participate in the Meadowbrook Indoor Flight Test on May 14th, 2016.

**Notes**

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## 1003 – Meadowbrook Flight Test

**Content**

As a member of the CERES team, I would like to test the CERES system in Dempsey Indoor.

**Definition of Done**

[ ] Participate in the Meadowbrook Indoor Flight Test on May 14th, 2016.

**Notes**

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## 1004 – Meadowbrook Data Reduction and GNC analysis

**Content**

As a member of the CERES GNC team, I would like evaluate the success of the Meadowbrook tests.

**Definition of Done**

[ ] Record all data, tlogs, and pictures.

[ ] Analyize the data to find the flight speeds, launch speed, flight path, etc.

[ ] Look into possible explanations of the flight path anomalies.

[ ] Modify the waypoint/control script to accommodate the changes.

[ ] Record all findings and present to the CERES team.

**Notes**

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## 1005 – CERES Airframe repair

**Content**

As a member of the CERES team, I would like repair the CERES airframe for future tests.

**Definition of Done**

[ ] Repair the damage to the airframe.

[ ] Take out the fluid system.

[ ] Re-do the CG analysis to find the correct CG location.

[ ] Re-do the internal airworthiness check. See **Error! Reference source not found.**.

**Notes**

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## 1006 – CERES Airframe repair - Helper

**Content**

See 1005 – CERES Airframe repair

**Notes**

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## 1007 – Magnuson Flight test preparation

**Content**

As an project manager and a member of the CERES team, I would like to ensure the logisitics are ready for the flight test and the necessary parties are informed of the details of the test.

**Definition of Done**

[ ] Hold a join flight test preparation meeting with the CERES team.

[ ] Ensure a pilot will be in attendence.

[ ] Make a packing list and ensure everything is compiled.

[ ] Contact TLG Aerospace to inform them of our intent.

[ ] Rent transporation for the test.

[ ] Pack all supplies.

**Notes**

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## 1008 – Magnuson Flight test preparation - Helper

**Content**

See 1007 – Magnuson Flight test preparation

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## 1009 – Magnuson Flight Test Structures Preparation and Modification

**Content**

As a structures engineer and a member of the CERES team, I would like to ensure the test structures are ready for the indoor flight test.

**Definition of Done**

[ ] Incorporate changes to the build from lessons learned at meadowbrook.

[ ] Test the flight structures and ensure strucutral integretiy during the flight test.

[ ] Find final carrier speeds for test rail and launcher tests and verify they are in the desired range.

[ ] Make any machine shop modifications to ensure final configurations.

**Notes**

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## 1010 – Final Poster Creation

**Content**

As a project manager, I would like to make a poster giving an overview of the project for display at the department’s poster session.

**Definition of Done**

[ ] Seek input from team members for descriptions and diagrams of subsystems

[ ] Design a poster incorporating all elements of the project

[ ] Print out the poster and bring it to the poster session

**Notes**

* A template that would work well for this is located in \CERES\TechnicalDataPackage\ProjectPlan\CERESProjectVision.pptx
* The creator of the poster will not be the only presenter of the poster. All team members will be required to spend equal amounts of time presenting the poster at the department poster session.

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## 1011 – Final Poster Creation - Helper

**Content**

* See 1010 – Final Poster Creation

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## 1012 – CERES Final Design Review Presenter – Position 1

**Content**

As CERES team member, I would like to update TLG Aerospace and the University of Washington aeronautics community on the progress on the CERES capstone project through the presentation of a FINAL Design Review.

**Definition of Done**

[ ] Create a power point presentation and present to Andrew McComas for verification.

[ ] Make a 50 minute long presentation on June 8th, 2016.

[ ] Updates within the FDR should include the following:

**Presentation content:**  Each presentation must contain all of the following information to the best of the team's ability within the time limit.

1. **Presentation (1 pt)**
   1. Grammar:  All grammar must be correct.
   2. Spelling:  All spelling must be correct.
   3. References:  All external references (print, web, etc) must be appropriately cited and appear in an appropriate location in the presentation.
   4. Formatting:  The formatting of the presentation must be clean and legible at an appropriate distance for viewing.
   5. Acknowledgement:  All funding sources must be indicated.  All team members including advisor and mentor must be listed.  All team member contributions must be acknowledged.
   6. Team member verbal engagement:  Each team member must be present for the presentation and participate in answering questions.  Answers must be provided in a professional manner with appropriate detail, clarity and succinctness.
2. **Introduction (1 pt)**
   1. Problem statement:  Clearly indicate the open problem that was to be addressed by the engineering solution of the capstone project.
   2. Motivation/background:  Clearly indicate the justification for the need for the solution, other approaches that have been taken to the problem (and some assessment of them), and any other relevant context of the problem.
   3. Customer specifications:  Clearly indicate any design specifications given by the sponsor (physical, societal, budgetary, regulatory, etc).
3. **Analysis-Based Design Process (1 pt).**  Present the design process from conceptual to detail design.  All projects must demonstrate thorough **analysis-based engineering design**, not just a selection of results.
   1. Project analysis components:  Indicate what elements of engineering analysis were employed as part of this project.  For example, if the project required structural design to decrease component weight, what tools were used to assess stress distribution in the lighter product.
   2. Tools used and justification:  What analytical tools were used and why?  Also include any physical testing or computational testing that was performed to assess and update designs.
   3. Verification of results:  What were your tests for whether your product met the customer design specifications?
   4. What was the process for updating the design?  Specifically, what analytical tools were used to drive this process?
4. **Product and Detail Design (2 pts).**  Present analysis, tests, and analysis/test correlations for the final design in all areas.
   1. Deliverables and end product:  What are the deliverables to the customer?  All deliverables should include a detailed engineering report and design drawings.  Some products may include computational packages and/or code.
   2. Show how the final design meets the requirements. In areas where it does not meet the RFP, discuss why and suggest corrective action.
   3. Final budget and cost.
   4. Final schedule (including any facilities use).  All projects should give a final product development timeline in Gantt chart format or similar.  You are welcome to use whatever software you like.  All timelines must indicate facility use needs (e.g., wind tunnel, 3D printing, software usage, etc), deviations from original schedule, additional items, etc.
   5. Impact/contribution:  Clearly indicate the actual impact of the resulting solution and prototype.
   6. Ethical consideration and environmental impact:  Clearly indicate ethical considerations that are relevant to the problem, design solution, and impact (e.g., public policy/perception, federal policy, clean energy, environmental impact).
   7. Present key lessons and conclusions.

## 1013 – CERES Final Design Review Presenter – Position 2

**Content**

* See 1012 – CERES Final Design Review Presenter – Position 1

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## 1014 – CERES Final Design Review Presenter – Position 3

**Content**

* See 1012 – CERES Final Design Review Presenter – Position 1

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## 1015 – CERES Final Design Review Presenter – Position 4

**Content**

* See 1012 – CERES Final Design Review Presenter – Position 1

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## 1016 – CERES Final Design Review Presenter – Position 5

**Content**

* See 1012 – CERES Final Design Review Presenter – Position 1

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## 1017 – CERES Final Design Review Presenter – Position 6

**Content**

* See 1012 – CERES Final Design Review Presenter – Position 1

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## 1018 – CERES Budget Planning

**Content**

As the financial lead for the CERES team I would like to ensure that all of the reimbursements and finalizations have been done before the end of the project.

**Definition of Done**

[ ] Compile all reimbursments and update the procurement document.

[ ] Create a representation of the CERES subsystem spending.

[ ] Ensure that all team members recived reimbursements

**Notes**

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## 1019 – Visual Anchoring Journal Article

**Content**

As a researcher, I would like to publish the results of the visual anchoring project to a journal article so I can increase visibility of the work.

**Definition of Done**

[ ] Research and identify a journal with high impact factor to submit this work to (see notes)

[ ] Download and read example papers from this journal and use this as a template/example for our article.

[ ] Write a journal article. Some results to incorporate include but are not limited to

[ ] all information from conference paper (see ‘1034 – Visual Anchoring Conference Paper’)

[ ] flight test data

[ ] Coordinate with Chris Lum to submit the article

**Notes**

* Some ideas of journals include (examples located at \\VisualAnchoring\TechnicalDataPackage\JournalArticle\ExampleArticles)
  + AIAA Journal of Aerospace Information Systems
    - \\VisualAnchoring\TechnicalDataPackage\JournalArticle\ExampleArticles\AIAA\_JAIS\_VideoGuidanceUAS.pdf is a VERY similar paper. This also illustrates and example where the paper started as a conference paper and then was promoted to a journal article.
  + AIAA Journal of Aircraft
  + IEEE Transactions on Automatic Control

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## 1020 – CERES Journal Article

**Content**

As a researcher, I would like to publish the results of the CERES project to a journal article so I can increase visibility of the work.

**Definition of Done**

[ ] Research and identify a journal with high impact factor to submit this work to (see notes)

[ ] Download and read example papers from this journal and use this as a template/example for our article.

[ ] Write a journal article. Some results to incorporate include but are not limited to

[ ] description of the aircraft (weights, L/D, propulsion, etc.)

[ ] description of the crop dusting spray system (hardware and software)

[ ] description of path planning software (BARNSTORMER)

[ ] engineering analysis (CFD of spray system, launcher calculations, etc.)

[ ] description of indoor test rail system

[ ] flight test data from indoor test (describe spray coverage tests)

[ ] physical description and block diagram of the system

[ ] flight test data

[ ] Coordinate with Chris Lum to get the article through TLG Aerospace’s internal review process

[ ] Coordinate with Chris Lum to submit the article

**Notes**

* Some ideas of journals include
  + AIAA Journal of Aircraft
    - Example papers from this journal are located at \\CERES\TechnicalDataPackage\JournalArticle\ExampleArticles
  + Precision Agriculture (<http://link.springer.com/journal/11119> )
* Ensure that Andrew McComas is an author of the article
* See [1] for more information

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## 1021 – Mapping Journal Article

**Content**

As a researcher, I would like to publish the results of the mapping project to a journal article so I can increase visibility of the work.

**Definition of Done**

[ ] Research and identify a journal with high impact factor to submit this work to (see notes)

[ ] Download and read example papers from this journal and use this as a template/example for our article.

[ ] Write a journal article. Some results to incorporate include but are not limited to

[ ] description of the aircraft (weights, L/D, propulsion, etc.)

[ ] description of the payload system (Canon S100 and RedEdge)

[ ] results of orthomosaic process

[ ] EO orthomosaics

[ ] DEMs from photogrammatry (Agisoft and Atlas)

[ ] NDVI maps from Agisoft and Atlas

[ ] Repeatability of results (compare results over several flight tests)

[ ] physical description and block diagram of the system

[ ] various flight test data

[ ] Coordinate with Chris Lum to submit the article

**Notes**

* Some ideas of journals include
  + Precision Agriculture (<http://link.springer.com/journal/11119> )
* See [2] for more information

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## 1022 – Arduino with Matlab and Simulink

**Content**

As an AA448 instructor, I would like to recreate the xPC Target environment using an Arduino system so I can use it for AA448 during Winter 2017.

**Definition of Done**

[ ] Coordinate with Chris Lum

[ ] Review documentation written by Mathias H.

[ ] Obtain necessary hardware

[ ] Arduino Due

[ ] breadboard

[ ] components to build biasing circuit

[ ] Obtain necessary software

[ ] Matlab & Simulink (see notes)

[ ] Arduino IDE

[ ] Build the system and perform preliminary testing

[ ] Verify that we can replace lab 1, 2 ,and 3 with this system.

[ ] Present results to research group

[ ] Additional task TBD

**Notes**

* Determine which version of Matlab/Simulink is available on the GUG 205 computers. Also determine which version is available to students on their personal machines. Consult with Chris Lum regarding which version to use.

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## 1023 – Arduino with Matlab and Simulink (Update Documentation)

**Content**

As an AA448 instructor, I would like to update update lab documentation to reflect the new Arduino system so I can use it for AA448 during Winter 2017.

**Definition of Done**

[ ] Coordinate with Chris Lum

[ ] Update lecture notes to reflect the new Arduino system.

[ ] Update lab documentation and procedures to reflect the new Arduino system.

[ ] Review results with Chris Lum

**Notes**

* Lecture notes are written in Mathematica

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## 1024 – Arduino with Matlab and Simulink (Position 2)

See ‘1022 – Arduino with Matlab and Simulink’

## 1025 – Arduino with Matlab and Simulink (Update Documentation) (Position 2)

1023 – Arduino with Matlab and Simulink (Update Documentation)

## 1026 – Custom Mission Planner and ArduPlane Builds

**Content**

As a software developer, I would like to build Mission Planner and Arduplane from source code so that I can make custom modifications to it to support custom flight modes.

**Definition of Done**

[ ] Coordinate with Chris Lum AND Tadej Kosel before starting this user story.

[ ] Follow the steps outlined at \\VisualAnchoring\TechnicalDataPackage\MissionPlannerModification\MissionPlannerBuildNotes.docx and build the custom version of Mission Planner located at \\VisualAnchoring\MissionPlannerUW.

[ ] Walk through the steps outlined at <http://ardupilot.org/dev/docs/buildin-mission-planner.html> to build the latestet version of Mission Planner using Visual Studio.

[ ] Find the latest, stable branch of Mission Planner and download it to a folder similar to the \\VisualAnchoring\MissionPlannerUW folder. Consult with Chris and Gage BEFORE you check this into Perforce.

[ ] Add to the \\VisualAnchoring\TechnicalDataPackage\MissionPlannerModification\MissionPlannerBuildNotes.docx to reflect steps necessary to build the latest version of Mission Planner from source code. Do NOT delete the old notes, simply move these to an Appendix.

[ ] Integrate the custom UW changes into the new version of Mission Planner.

[ ] Verify that you can build this on another machine.

[ ] Verify that this works with the custom flight mode on ArduPlane.

[ ] Check results with Chris and Tadej

**Notes**

* The goal of this story is to take the existing custom UW version of Mission Planner and move these changes to the newer version.
* Be sure to add notes about the relevant version numbers of Mission Planner.
* Print the above mentioned tutorial to a pdf and embed this into the build notes document so that we have this in case the website/link is ever changed.

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## 1027 – Custom Flight Mode Build

**Content**

As a software developer, I would like to create a custom flight mode UW\_MODE\_4 so that I can learn how to write code for the Pixhawk.

**Definition of Done**

[ ] Coordinate with Chris Lum before starting this user story.

[ ] Create a UW\_MODE\_4 in the customized Arduplane and Mission Planner

[ ] This mode should output signals to all 8 output channels. Use simple test signals for each of the channels (for example a slow sin wave on one, a square on another, etc.)

[ ] Connect 8 servos to the Pixhawk and ensure that the servos move as expected

[ ] Determine how to read sensor data from the Pixhawk (for example the roll, pitch, yaw angles).

[ ] Modify the UW\_MODE\_4 to output servo deflections based on the inputs (for example change the type of output signal depending on what pitch angle the Pixhawk is experiencing)

[ ] Integrate this on the HiL

[ ] Check in changes to GitHub

**Notes**

* Check Gage’s UW\_MODE\_1 and use it as a reference.

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| 1028 – AFSL Large Multi-Rotor Build **Content**  As a UAS operator, I would like to assemble a large scale, professional multi-rotor system that I can use as a research platform for AFSL endeavors.  **Definition of Done**  [x] Coordinate with Chris Lum before starting this user story.  [x] Build Multi-Rotor Frame  [x] Organize parts  [x] Install Pixhawk and all electronics  [x] Download mission planner onto multi rotor  [ ] Ensure multi-rotor is airworthy  [ ] Install FPV system  [ ] Install Gimbal and Camera  [ ] Install airspeed sensor  [ ] Ensure aircraft is registered  **Notes**   * Build of User story 973  1029 – ArduCopter Testing and Implementation **Content**  As a UAS operator, I would like to test and implement arducopter into multirotors in the lab, beginning with MARV.  **Definition of Done**  [x] Coordinate with Chris Lum before starting this user story.  [x] Ensure MARV is airworthy and take necessary steps to make sure this is the case  [ ] Test to confirm flight time with a single 1500 mAh battery  [x] Pair MARV with transmitter M (Multirotor Transmitter)  [ ] Test stabilize and loiter modes  [ ] Get MARV registered  [ ] Test auto mode (with waypoints) using a simple square path  [ ] Carry out a fully autonomous mission  [ ] Auto takeoff  [ ] Auto flight path  [ ] Auto land  **Notes**   * Testing of Arducopter to be implemented on Argo  |  | | --- | |  | |

## 1030 – CERES High Start System (Position 1)

**Content**

As a UAS operator, I would like to implement the high start launching mechanism for CERES.

**Definition of Done**

[x] Coordinate with Chris Lum before starting this user story.

[x] Research different high start bungee designs.

[x] Make modifications to High Start System to make CERES airworthy.

[x] Fix CERES damages from flight test (7/15/16)

## 1031 – CERES High Start System (Position 2)

**Content**

As a UAS operator, I would like to implement the high start launching mechanism for CERES.

**Definition of Done**

[x] Research different high start bungee designs.

[x] Acquire parts for high start system.

[x] Draft designs for PVC base.

[x] Assemble PVC base.

[x] Install hooks into CERES.

[x] Fix CERES damages from flight test (7/15/16).

## 1032 – CERES High Start System (Position 3)

**Content**

As a UAS operator, I would like to implement the high start launching mechanism for CERES.

**Definition of Done**

[x] Research different high start bungee designs.

[x] Acquire parts for high start system.

[x] Assemble PVC base.

[x] Install hooks into CERES.

## 1033 – PAM ICPA Preparation

**Content**

As a UAS researcher, I would like to prepare for a conference presentation.

**Definition of Done**

[x] Register for the ICPA

[x] Make travel accomadations

[x] Make a rough draft of slides with reference to the lab template and the Australia Study Abroad version

[x] Meet with Dr. Lum regarding the slides and presentation content

[x] Make a final draft of slides

[x] Practice presenting

[x] Present during a lab-wide meeting to get feedback

[x] Refine presentation

**Notes**

## 1034 – Visual Anchoring Conference Paper

**Content**

As a researcher, I would like to publish the results of the visual anchoring project to a conference paper

so I can increase visibility of the work.

**Definition of Done**

[ ] Research and identify a conference to attend

[ ] Write a conference paper. Some results to incorporate include but are not limited to

[ ] description of the outer loop orbit controller

[ ] description of the image processing algorithm

[ ] description of how to obtain slant range

[ ] simulation results of the visual anchoring system (both in Simulink and ArduPlane/JSBSim)

[ ] physical description and block diagram of the system

[ ] Coordinate with Chris Lum to submit the paper

**Notes**

* Eventually we want this work to be published in a journal (see user story ‘1019 – Visual Anchoring Journal Article’)
* Some ideas of conferences are
  + AIAA SciTech (<http://www.aiaa-scitech.org/> )
    - We likely need to publish in SciTech 2018
    - Abstract likely due on June, 2017
  + American Control Conference (<http://acc2017.a2c2.org/index.html> )
    - This will be in Seattle, WA
    - Draft manuscript due Sept. 19, 2016

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## 1035 – GROVER Operational Checklists And Notes

**Content**

As a researcher, I would like to create an operators manual for GROVER.

**Definition of Done**

[x] Check the maintenance and performance of GROVER

[x] Coordinate with Chris Lum

[x] Create a generic Skywalker 1900 aircraft flight manual (AFM) (see \\FlightOperations\UAS\Skywalker\_X8\UW\_Skywalker\_X8\_AFM.docx

[x] Reorganize the information in the \\FlightOperations\UAS\GROVER\OperationalChecklistsAndNotes.docx document and use this to create and aircraft flight manual for GROVER (for example see how \\FlightOperations\UAS\HAPRA\HAPRAAircraftFlightManual.docx is derived from the generic Skywalker X-8 manual)

[ ] Delete the old document and ensure the new document has an official publication number and update the file \\TechnicalDataPackage\AFSLPublicationNumbers.docx

[ ] Review results with Chris Lum

[ ] Present results to research group.

**Notes**

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## 1036 – JCATI Flight Test TRAPIS Operator Training

**Content**

As a JCATI flight test member, I would like to learn how to use the TRAPIS software package.

**Definition of Done**

[ ] Familiarize yourself with the TRAPIS user interface by building and running the TRAPIS solution

* Code located at \JCATI2015\Software\UW\TRAPIS\TRAPIS.sln
* If you need help with this step, consult with Bobby Larson
* Ensure you know how to pair vehicles and save the data to KML files at the end of a test run

[ ] Review LAMS simulator documentation

* Documentation located at \JCATI2015\Software\ANPC\LAMS\_User\_Guide.docx
* Ensure you know how to use the LAMS simulator between two machines in order to simulate a LAMS data stream
* Test the LAMS simulator by connecting two machines and ensuring that the LAMS information from the simulator can be ingested with the TRAPIS user interface

[ ] Familiarize yourself with the TRAPIS Simulator code by building and running the TRAPIS Simulator

* \JCATI2015\Software\UW\TRAPISSimulator\TRAPISSimulator.sln
* If you need help with this step, consult with Bobby Larson

[ ] Perform a test of the TRAPIS user interface while running the TRAPIS Simulator code

* Pair all appropriate LAMS and ADSB streams with the TRAPIS user interface
* Write all simulation information (data streams, estimates, fusers) to KML files
* Ensure that KML files can be read in Google Earth

[ ] Perform additional tests as necessary to become comfortable with the TRAPIS user interface, specifically with pairing LAMS and ADSB data streams for an aircraft

[ ] Familiarize yourself with the JCATI 2015 flight test document

* The document is located at \FlightOperations\Operations\Missions\16\_09\_22\_dallesport\MissionDocument.docx
* Ensure you are familiar with the proposed flight plans for pairing of LAMS and ADSB data streams

**Notes**

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## 1037 – JCATI Flight Test Payload Technician Training

**Content**

As a JCATI flight test member, I would like to learn how to use the TRAPIS payload

**WARNING: Do not attempt to turn on the TRAPIS payload without first consulting with Bobby Larson. Failure to properly protect the transponder before power-up will result in significant damage to the unit.**

**Definition of Done**

[ ] Familiarize yourself with the TRAPIS payload user manual

* Manual located at \FlightOperations\UAS\CommonDocuments\ADSBPayload\ADSBPayloadUserManual.docx
* Ensure you know how to operate the TRAPIS payload

[ ] Familiarize yourself with the Arduino code associated with the TRAPIS payload

* Documentation located at \FlightOperations\UAS\CommonDocuments\ADSBPayload\ADSBPayloadUserManual.docx
* Ensure you know how to change necessary parameters in the Arduino code for the TRAPIS payload

[ ] Perform a test with the transponder to ensure everything works as planned

* Consult with Bobby Larson before conducting this test
* Do not perform this test near the AERB

**Notes**

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## 1038 – JCATI Flight Test Clarity Receiver Technician Training

**Content**

As a JCATI flight test member, I would like to learn how to use the Clarity ADSB receiver

**Definition of Done**

[ ] Familiarize yourself with the Clarity ADSB receiver user manual

* Manual located at \JCATI2015\TechnicalDataPackage\ManufacturerDocs\Sagetech\DOC7015R01-Clarity User Manual.pdf
* Ensure you know how to operate the Clarity Receiver with an iPad

[ ] Familiarize yourself with the WingX app installed on the AFSL iPad

* Ensure you know how to connect the Clarity ADSB receiver with the AFSL iPad for use with WingX 7
* If you have trouble with this step, consult with Bobby Larson

[ ] Walk around campus with the WingX app open and the Clarity receiver to ensure air traffic information can be received and tracked

* If you have trouble with this step, consult with Bobby Larson

[ ] Consult with the lab member completing US 1036

* Ensure both lab members understand the basics of the Clarity ADSB receiver
* Ensure both lab members understand how the information from the Clarity ADSB receiver works into the TRAPIS user interface

**Notes**

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## 1039 – Using Mission Planner to execute Python scripts and output distance to home data to an external computer

**Content**

As a JCATI researcher, I would like to learn how to export distance to home data to an external computer.

**Definition of Done**

[ ] Review and familiarize myself with Tadej’s work with using mission planner to execute python scripts.

[ ] Find code for writing a python script that opens a UDP connection to external computer

[ ] Open a UDP port from a Python script

[ ] Integrate Python script into Mission Planner

[ ] Successfully view distance to home data on an external computer

**Notes**

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## 1040 – JCATI Drone Procurement and SDR board testing

**Content**

As a JCATI researcher, I would like to procure a drone for testing the SDR board, and then determine its ability to test the SDR board.

**Definition of Done**

[x] Determine a drone to use for testing the SDR

[ ] Procure drone

[x] Work with Keith to do this

[ ] Determine how to mount SDR

[ ] Mount SDR

[ ] Test the Drone to make sure it can sufficiently carry out testing of the SDR

**Notes**

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## 1041 – 3D Printing Parts

**Content**

As a manufacturing engineer, I would like to utilize 3D printers so that I can use it to manufacture parts and prototypes.

**Definition of Done**

[x] Coordinate with Chris Lum before starting this story

[x] Read about avaliable 3D printers at: <http://www.aa.washington.edu/operations/equipment.html>

<http://comotion.uw.edu/makerspace>

[x] Determine how to use the printer for fabricating parts.

[x] Generate a prototype part.

[x] Document the process/workflow used.

[x] Present results to the research group

[x] Check in document in the appropriate location in Perforce (coordinate with Chris Lum before uploading data).

**Notes**

 User story is similar to 487 – UWAA 3D Printing Investigation.

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## 1042 – Vulcan SLA-1500 Configuration

**Content**

As a researcher, I would like to partner with Vulcan to configure a SLA-1500 camera on a skywalker 1900

**Definition of Done**

[x] get the camera configured and taking data

## 1043 – Vulcan SLA-1500 Documentation

**Content**

As a researcher, I would like to write instructions and procedures for the SLA-1500 Camera

**Definition of Done**

## 1044 – Flight Operations Work Items

**Content**

As a UAS operator, I would like to address the following items so that flight operations will be more effective and efficient.

**Definition of Done**

HIGH PRIORITY

[x] Start a training program for simulator, etc

[x] Create a system to track parts

[x] Research and purchase a communication solution that can be used for the KDLS mission. Two parties will be separated by approximately 3SM with line of sight. We need a solution that does not infringe on air band frequencies.

[x] Obtain an ADS-B in receiver that can pair with an iPad to display traffic for the flight team at KDLS.

[x] Read AC 107-2 and ensure that policies and checklists for the lab allow us to be part 107 compliant

[ ] Ensure to-do items on MFOC construction and maintenance log are complete

[ ] Ensure to-do items on TEDD construction and maintenance log are complete (Scott)

[ ] Ensure to-do items on Luke construction and maintenance log are complete

[ ] Ensure to-do items on Leia construction and maintenance log are complete

[x] Ensure all flight logs have time stamping macro embedded in it. (Scott)

[x] Encourage part 107 certification

[x] Configure RF spectrum analyzer (Scott)

[x] Get ucar account

[ ] Update Talon AFM supplement (Scott)

[x] Add stickers, decals, logos, etc to aircraft to make them “camera ready” (Aaron)

[x] Ensure AMA safety code compliance

[x] Test out the CB radio communication solution

[x] Find a solution to secure the aircraft wings to the trailer shelves

[x] Rename “Cold Weather Gear” box to “Outdoor Gear Box” (so it can include sunglasses, rain gear, etc.)

[x] Look into throttle and autopilot issue

MEDIUM PRIORITY

[ ] Start a “maintenance manager” spreadsheet. This should track critical items such as autopilots, transmitters, etc. and note when they need periodic service or maintenance.

[x] Research and purchase a spectrum analyzer (to identify radio frequency activity in bands necessary for operations such as 915 MHz, 2.4 GHz, 5.8 GHz, 1090 MHz, 978 MHz, 20ish MHz, 120ish MHz, 800 MHz-5.8 GHz etc.)

[x] Review job descriptions and once finalized, print out in small, card sized pieces. Laminate these pieces and attach them to the MFOC so they can be handed out to participants during operations. (Sue)

[x] Reorganize and relabel all shelves in the lab (boxes should probably be organized by size/function)

[ ] Reorganize and relabel all shelves in the MFOC

[ ] Perform full aircraft registration for Argo (so we obtain an N-number and ICAO address, talk with Chris Lum)

[x] Build a battery charging station in the lab (aircraft LiPo batteries, DeWalt batteries, AA batteries, etc.) (Chris)

[x] Make a charger so we can charge the Dominator goggles (Scott)

[ ] Reorganize lab member certifications (see \\FlightOperations\Operators\Certifications). This should contain a way to track a given member’s certifications (FAA, FCC, AMA, etc.) and note when they expire. Collect and sort

[ ] Get Procard

[x] Contact Vulcan for how they would like to proceed with the Talon

LOW PRIORITY

[ ] Obtain lab member certifications (private pilot license documentation, remote pilot certifications, HAM radio, etc.) and archive these in \\FlightOperations\Operators\Certifications

[ ] Establish emergency procedures for lost-link, flyaway, etc. Integrate these into the checklists and conduct training for all operators

[x] Review and update the \\AFSL\LabInfo\LabSafety.docx, especially the safety and performance regarding LiPo battery safety. Brief all group members regarding proper LiPo battery safety (do this at a group meeting).

[ ] Plan for and conduct a LiPo battery fire drill (talk with Chris Lum)

[x] Procure more canopy bolts for the Skywalker 1900 aircraft.

[ ] Ensure to-do items on Argo construction and maintenance log are complete

[ ] Ensure to-do items on MARV construction and maintenance log are complete

[x] Rearrange and evaluate the state of AFSL deep storage in the Kirsten Wind Tunnel

[ ] Add a python interpreter on AFSLPrecision02

[ ] Write a user story for Matlab ArduCopter analysis

[ ] Ensure MARV AFM is satisfactory.

[x] Build a landing platform for multirotor aircraft. This can be as simple as a sheet of plywood strapped on top of the two large Husky storage boxes.

[ ] Ensure all lab members have completed lab safety training and signed form in \\FlightOperations\Operators\Certifications\AFSL\_safety

[ ] Ensure all lab members have liked/followed the lab facebook page

**Notes**

* These items do not need to be completed within a single sprint, they can be broken up into multiple user stories.

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## 1045 – JCATI 2015 KalmanFuser Code Updates

**Content**

As a software developer, I would like to ensure that the KalmanFuser code associated with the JCATI 2015 project works in a variety of scenario simulating GPS-degraded and GPS-denied flight operations.

**Definition of Done**

[ ] Test the KalmanFuser code with a variety of scenarios within the TRAPIS software framework to ensure that it handles GPS-degraded and GPS-denied environment scenarios

[ ] Make changes to the KalmanFuser code as necessary to ensure such flight scenarios are handled accordingly

[ ] Test the KalmanFuser code in TRAPIS while using the LAMSSimulator software to ensure that aircraft pairings remain regardless of GPS integrity

[ ] Ensure that new KalmanFuser code gets tested in the field

**Notes**

* New KalmanFuser code was tested during 08/25/16 Meadowbrook Farms flight test using transponder flown on Leia aircraft

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## 1046 – ADS-B Transponder Integration on Leia Aircraft

**Content**

As a flight technician, I would like to integrate the TRAPIS ADS-B payload on the Leia Skywalker 1900 aircraft and test the implementation to ensure that it works appropriately.

**Definition of Done**

[ ] Mount the ADS-B payload into the payload bay of the Leia aircraft and ensure that the ADS-B antenna is placed in a manner required to avoid electromagnetic interference

[ ] Ensure that transponder can be powered on in standby mode indoors to avoid possible conflicts with air traffic control

[ ] Perform a ground test of the Leia aircraft to ensure all control surfaces work with the transponder powered on in standby mode

[ ] In the field, perform a ground test of the Leia aircraft with the transponder operating on ALT mode. Ensure that all aircraft control surfaces work regardless of transponder operation, and ensure that the transponder can be seen using the WingX software with the Clarity ADS-B In receiver

**Notes**

* Ground test performed during 08/25/16 flight test at Meadowbrook Farms

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## 1047 – ADS-B Transponder Payload Flight Test

**Content**

As a flight technician, I would like to test the integration and implementation of the transponder ADS-B payload on the Leia Skywalker 1900 aircraft.

**Definition of Done**

[ ] Mount the ADS-B payload into the payload bay of the Leia aircraft and ensure that the ADS-B antenna is placed in a manner required to avoid electromagnetic interference

[ ] Ensure that user story 1046 has been completed to include all required ground testing

[ ] Ensure that the transponder operates and can be tracked in TRAPIS in three flight scenarios

* GPS signal provided to the transponder is not being altered in any manner
* GPS signal provided to the transponder is being degraded to a NACp value of 8
* GPS signal provided to the transponder is being artificially denied (per documentation for Arduino Mega board code associated with transponder)

[ ] Ensure that ADS-B payload can be recovered on the aircraft after the flight tests without damage or other incident

**Notes**

* Flight tests performed during 08/25/16 flight test at Meadowbrook Farms

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## 1048 – Perforce Visual Client (copy)

See User Story **Error! Reference source not found.**

**1049 – Luke ADS-B Transponder Payload Construction**

**Content**

As a payload technician, I would like to create a second ADS-B transponder payload to incorporate into the Luke aircraft for use in the JCATI 2015 flight demonstration.

**Definition of Done**

[ ] Acquire all parts necessary to create a second ADS-B payload for use with the Luke aircraft

[ ] Acquire a second XPS-TR ADS-B transponder from Sagetech for use with the payload

[ ] Construct the second transponder payload as required for the Luke aircraft

[ ] Perform a test with the second transponder payload during the 09/09/16 Meadowbrook TRAPIS dress rehearsal flight test

**Notes**

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**1050 – Soldering LiPo Batteries**

**Content**

As a payload technician, I would like to prepare new LiPo batteries to be used for various operations.

**Definition of Done**

[x] Acquire all parts necessary to solder XT60 connections onto the batteries

[x] Apply Velcro to each battery

[ ] Charge each battery if they are below 95% of a charge

**Notes**

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**1051 – Skywalker 1900 Repairs and Construction**

**Content**

As a construction engineer, I would like to repair all currently operating Skywalker 1900s to be airworthy.

**Definition of Done**

Repair damages occurred from flight testing, such as:

[x] Epoxy and reinfornce face and various cracks on the fuselage

[x] Inspect T-nut construction on the tail

[x] Epoxy the horizontal stabilizer onto the tail

[x] Install manufactured parts onto all 1900s

Manufacture necessary parts, such as:

[x] 3D print supports for the horizontal stabilizer

[ ] Potential plates to if there is a second battery on the TRAPIS payload

[ ] Model and construct Vulcan Camera cover to fit in TEDD

[] Create an inspection schedule for all 1900s

**Notes**

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**1052 – CERES and High Start Modification (Position 1)**

**Content**

As a UAS operator, I would like to prepare CERES to be test-flown again.

**Definition of Done**

[x] Repair the damage to CERES from the most recent unsuccessful experiment.

[x] Shorten the center lengths of the high start so that CERES will be more stable on the rails.

[x] Shorten the front uprights of the high start so that the takeoff angle will be less steep.

**Notes**

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**1053 – CERES and High Start Modification (Position 2)**

**Content**

As a UAS operator, I would like to prepare CERES to be test-flown again.

**Definition of Done**

[x] Repair the damage to CERES from the most recent unsuccessful experiment.

[x] Shorten the center lengths of the high start so that CERES will be more stable on the rails.

[x] Shorten the front uprights of the high start so that the takeoff angle will be less steep.

**Notes**

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**1054 – Decals and Lab Information**

**Content**

As a UAS operator, I would like to add necessary decals to the UAS fleet for regulatory and PR purposes.

**Definition of Done**

[x] Add decals as deemed appropriate to aircraft, so that they clearly belong to the University of Washington and AFSL.

[ ] Print more decals.

[ ] Add aircraft names to any aircraft that are not labelled.

[ ] Add contact information to any aircraft that do not have it.

**Notes**

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**1055 – Part 107 Test Preparation**

**Content**

As a researcher, I would like to prepare for and take the FAA Part 107 Commercial Remote Pilot Certification test.

**Definition of Done**

[x] Take the online course offered by the FAA

[x] Take the three practice tests on the network drive

[x] Study all topics identified as weak when taking practice tests

[x] Take the part 107 test

[x] Do the paperwork to get the license from the FAA

[x] Do the paperwork to get reimbursed for test

**Notes**

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**1056 – Fat Shark Dominator V3 Head Tracking Configuration**

**Content**

As a researcher, I would like to configure the Fat Shark Dominator head tracking googles with a FPV camera.

**Definition of Done**

[x] Assemble Fat Shark Dominator with gyro and receiver modules

[x] Establish connection between Dominator to A/V transmitter

[x] Configure Turnigy 9X transmitter to connect to Dominator googles

[x] Test googles to ensure head tracking FPV camera is properly working

**Notes**

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**1057 – Flight Operations Work Items (Position 1)**

**Content**

As a UAS operator, I would like to address the following items so that flight operations will be more effective and efficient. See user story 1044 for the full list.

**Definition of Done**

[x] Ensure to-do items on TEDD construction and maintenance log are complete

[x] Ensure all flight logs have time stamping macro embedded in it.

[x] Make a charger so we can charge the Dominator goggles

[x] Configure RF spectrum analyzer

[x] Create a new flight plan for TEDD for 9/16/16 meadowbrook excursion

**Notes**

* These tasks are copied from user story 1044

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**1058 – Flight Operations Work Items (Position 2)**

**Content**

As a UAS operator, I would like to address the following items so that flight operations will be more effective and efficient. See user story 1044 for the full list.

**Definition of Done**

[ ] Review job descriptions and once finalized, print out in small, card sized pieces. Laminate these pieces and attach them to the MFOC so they can be handed out to participants during operations.

**Notes**

* These tasks are copied from user story 1044

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**1059 – AFSL Battery Charging Station**

**Content**

As a lab member, I would like to set up a battery charging station in the lab for lipo, Android, Apple, and general chargers.

**Definition of Done**

[ ] Mount battery checker to station

[x] Create a bucket for “Needs Charging” batteries

[ ] Post nominal voltages for various batteries

[ ] Create a bucket for lipo safe bags and terminator caps

[x] Post fire extinguisher nearby

[ ] Create a sand box for battery safety

[ ] post list of safety/best practices

**Notes**

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## 1060 – EDF Jet Research

**Content**

As a UAS operator, I would like to research different EDF Jets for purchase

**Definition of Done**

[x] Coordinate with Chris Lum before starting this story.

[x] Research different EDF jets that can properly hold Pixhawk payload

[x] Research different FPV camera and gimbal that can be mounted on EDF jet

[x] Make a recommendation to Chris Lum regarding which systems to procure

**Notes**

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## 1061 – Talon UAS

**Content**

As a UAS operator, I would like to research the specifications of the Talon UAS for mapping with the SLA-1500

**Definition of Done**

[ ] Investigate Talon UAS

[ ] Update Talon AFM supplement

[ ] Investigate the feasibility of having the SLA-1500 as a payload

[ ] Obtain footage from the SLA-1500 using the Talon UAS

**Notes**

* Tasks to be updated.

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## 1062 – Camera Research for Lab

**Content**

As a lab member, I would like to research a digital SLR camera and a handheld camcorder for the lab.

**Definition of Done**

[ ] Research two different camers with the following requirements:

1. Digital SLR:
   1. Ability to auto refocus when taking video
   2. Ability to be carried on Argo
   3. Reasonable optical zoom range (probably lens specific)
2. Camcorder
   1. Reasonable optical zoom range (not digital zoom)
   2. Writes files to a SD card
   3. 1080p resolution

[ ] Provide Dr. Lum with a few of the best options for each kind of camera considering cost and quality

**Notes**

* We want the camcorder to record flights and the digital SLR to take publicity photos and pictures of animals (like elk)

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## 1063 – Arduplane Parameter Standardization

**Content**

As a researcher, I would like to check all of the arduplane parameters to standardize them.

**Definition of Done**

[x] Check all arduplane parameters across the fleet to ensure that they are all standardized. The standardize paramters should be documented here: C:\dev\FlightOperations\UAS\CommonDocuments\ArduPlane\OperationalChecklistsAndNotes.docx

[x] Use this as a way to get familiar with all the parameters

[x] Alert Dr. Lum of any parameters that need changing or fix as necessary

[x] Fix parameters to allow full throttle on takeoff

**Notes**

* For example, the flight modes should all be the same and the arming procedures should be the same.  However things like the sensor offsets are specific to each aircraft.
* Throttle issue: it appears that when in stabilize mode, the autopilot handicaps the maximum throttle

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## 1064 – Rebuilding CONDOR

**Content**

As a lab member, I would like to rebuild CONDOR in support of the Visual Anchoring Team.

**Definition of Done**

[X] Receive Skywalker 1900 from lab and familiarize myself with kit.

[X] Research available documentation on Perforce and online to learn build best practices.

[X] Assemble 1900 airframe.

[X] Integrate all standard electrical components (Power, Servos, Pixhawk, Motor, etc).

[X] Integrate RxMUX board for redundant flight control independent of Pixhawk.

[X] CONDOR re-built and ready for flight.

**Notes**

* Build new Skywalker 1900 airframe.
* Build new power system, including power module, 2 power switches, and 65A ESC.
* Integrate the RxMux with the pixhawk configuration.
* Design with the intent of adding a 2 or 3 axis camera gimbal system later on.

The build was very time consuming with all the research required to bring myself up to speed on Skywalker 1900 builds. The slight differences in integrating the RxMux was also time consuming and educational. We will be proceeding with a very robust pre-flight check process to ensure that systems are all functioning properly and consistently.

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## 1065 – Skywalker 1900 Flight Characteristics

**Content**

As a lab member, I would like to use flight data to determine some of the Skywalker 1900 flight characteristics.

**Definition of Done**

[ ] Determine power off and power on stall speeds

[ ] Generate power required curve vs. weight vs. CG

[ ] Create a table to determine minimum safe airspeed depending on weight/cg/payload

**Notes**

* Tasks to be updated as they arise

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## 1066 – Checklists Software Research

**Content**

As a lab member, I would like to research preexisting software or programs available for creating and using checklists.

**Definition of Done**

[X] Research systems with the following criteria:

* Ability to have common checklists that are automatically pulled into different UAS checklists (i.e. we always check the battery on all systems, so we don’t want to repeat this over all the checklists)
* Ability to make note of who completed each item and when

[X] Determine if one or more systems currently exist

[X] If they do exist find one or more that we can try to see which works best

**Notes**

* Tasks to be updated

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## 1067 – Pre-Quarter Lab Cleanup

**Content**

As a lab member, I would like to clean up the lab space so that we can start the quarter off right.

**Definition of Done**

[ ] Find RF dummy load

[ ] Safely store LiPo batteries

[ ] Clean up lab

[ ] Clean up MFOC

**Notes**

* Everyone will participate in this one

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## 1068 – Create a TRAPIS Promo Video

**Content**

As a lab member, I would like to create a promo video of the TRAPIS system to be shared on YouTube and the website.

**Definition of Done**

[ ] Gather video/photos of TRAPIS project

[ ] Put together a promo video to allow general public to understand the impact of the work

[ ] Share video online

**Notes**

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## 1069 – Build Falco

**Content**

As a lab member, I would like to assemble Falco and make it airworthy.

**Definition of Done**

[ ] Assemble Falco with Pixhawk system, GPS, telemetry, and servos

[ ] Create a flight manual for Falco

**Notes**

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## 1070 – Create Landing Platform

**Content**

As a lab member, I would like to create a landing/takeoff platform for MARV and Argo.

**Definition of Done**

[ ] Create a viable platform using plywood and other materials so that MARV and Argo can land on something that is safely above the ground.

**Notes**

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## 1071 – Ensure Safety Survey Compliance

**Content**

As a lab member, I would like to make sure the lab is compliant with safety regulations.

**Definition of Done**

[ ] Look at lab safety survey results filed under \AFSL\LabInfo\SafetyInspections\16.09.25\_SafetySurveyResult.pdf

[ ] Address the required changes (red items with comments)

**Notes**

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## 1072 – Review Visual Anchoring Conference Paper

**Content**

As a lab member, I would like to get up to review the Visual Anchoring Conference Paper.

**Definition of Done**

[ ] Learn about the Visual Anchoring Project

[ ] Annotate difficulties that I have following specific parts of the conference paper

**Notes**

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## 1073 – Set Up Simulator

**Content**

As a lab member, I would like to set up the RC simulator.

**Definition of Done**

[ ] Connect a transmitter to the simulator

[ ] Make sure everything is configured

[ ] Test!

**Notes**

## 1074 – Update Inventory Doc

**Content**

As a lab member, I would like to update the inventory document to make sure it accurately reflects what is available in the lab and MFOC.

**Definition of Done**

[x] Access inventory list at \AFSL\LabInfo\EquipmentInventory\EquipmentInventory.docx

[x] Go through each equipment box in the AFSL and make sure that the inventory document reflects in just enough detail that someone looking for a certain item can look at the document and know which box to look in

[x] Relabel boxes or shelves if labels are falling off or improperly marked

[x] If something is clearly in the wrong box, find it a better home

[x] Once completed in the AFSL, make sure that all boxes have a labelled home in the MFOC (this may need to wait until everything is loaded into the trailer to see how it all fits)

**Notes**

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## 1075 – Add Parts into Component Tracker

**Content**

As a lab member, I would like to add all important parts into the Component Tracker sheet \FlightOperations\UAS\ComponentTracker.xlsx

**Definition of Done**

[ ] For all parts currently on UAS, label with a sharpie and input data into component tracker log

**Notes**

* As time permits, feel free to add in parts that aren’t currently on a UAS as well

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## 1076 – Find New Flight Test Locations

**Content**

As a lab member, I would like to research the possibility and feasibility of new flight test locations that meet Part 107 requirements and lab specific needs.

**Definition of Done**

[X ] Read pertinent sections of AC 107-2 <http://www.faa.gov/documentLibrary/media/Advisory_Circular/AC_107-2.pdf>, namely sections 5.8 and 5.11 and any others that specifiy where sUAS may be operated

[X] Using Google Earth, Google Maps, or another tool, find possible open spaces where we might be able to conduct flight operations in accordance with Part 107 requirements and lab specific needs

[X] Look up Meadowbrook Farm, North Bend for example location <http://www.meadowbrookfarmpreserve.org/>

[X] Look for an additional location(s) where a sUAS might be flown over exotic animals (something other than elk) for photography/research purposes

[X] Determine the pros and cons of each location and report to Hannah

**Notes**

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## 1077 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

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## 1078 – Wind Tunnel Deep Storage

**Content**

As a lab member, I would like to reorganize the lab’s deep storage space in the Kirsten Wind Tunnel.

**Definition of Done**

[ ] Rearrange and reevaluate the deep storage space

[ ] Determine if anything is non-functional or unnecessary and needs to be removed

[ ] Organize in a useful way

**Notes**

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## 1079 – Aircraft Part Familiarization

**Content**

As an equipment technician, I would like to learn about each component that is a part of the UAV.

**Definition of Done**

Familiarization with:

[ ] Servos, push rods, and control horns  
[ ] Motor and propeller  
[ ] Pixhawk  
[ ] Pixhawk connections including:

* Telemetry radio
* Power module
* Electronic Speed Controller (ESC)
* Buzzer and its various sounds
* Arm/disarm switch
* GPS
* External USB port
* Airspeed sensor

[ ] Motor and battery safety switches

[ ] LiPO batteries

[ ] Basic FPV apparatuses (i.e. Mobius camera, A/V Transmitter)

**Notes**

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## 1080 – Equipment Testing

**Content**

As an equipment technician, I would like to ensure the equipment used on each aircraft is ready for use.

**Definition of Done**

[ ] Inspect aircraft to be free of damage  
[ ] Check if the installed battery has above a 90% charge  
[ ] Ensure the 3DR radios (ONLY the knock-off brand radios) are of the correct gender to communicate with the GCS  
[ ] Ensure Pixhawk contains microSD card  
[ ] Test if dataflash and telemetry logs can be gathered on the Pixhawk and GCS, respectively  
[ ] Check motor and propeller orientation

**Notes**

* Recommended to do Aircraft Part Familiarization user story

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## 1081 – Battery Charging

**Content**

As an equipment technician,  I would like to ensure batteries are ready for use.

**Definition of Done**

[ ] Know where the Emergency box is located  
[ ] Check through all the battery boxes for the charge on the LiPO batteries  
[ ] Charge batteries that hold less than 90% of a charge  
[ ] Charge Transmitter batteries  
[ ] Charge AA batteries  
[ ] Charge Mobius cameras and other FPV gear

**Notes**

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## 1082 – Social Media Updates

**Content**

As a lab member, I would like to update the activities of the lab for publicity on the AFSL website, Facebook, and YouTube pages.

**Definition of Done**

[ ] Consult with Chris Lum on the activity’s description and prospective posting photos/videos.

[ ] Frequently post profiles of lab members and their specific involvement in the lab on Facebook.

For every post-flight test:

[ ] Upload selected videos from the flight test onto YouTube.

[ ] Update the video description (follow the template on YouTube)

[ ] Make sure each video tag includes: university of washington autonomous flight systems laboratory uw afsl test (schoolyear e.g. 20162017) (date e.g. 20161119) (location e.g. meadowbrooke farm) (UAS e.g. tedd) run (run# e.g. 001) (title)

[ ] everything is in lowercase

[ ] every word has a space in between

[ ] exclude all the parenthesis

[ ] Make sure the uploaded videos are included in their perspective playlists (it is possible for each video to be in more than one playlist)

[ ] Share the videos uploaded onto YouTube on Facebook.

[ ] Upload selected photos from the flight test onto Facebook.

[ ] Confirm that the photos and videos from each flight test are uploaded onto K drive.

Flight Test:

[ ] “Date (e.g. 20161126)” @ “Location (e.g. Meadowbrooke Farm)”

[ ] “Date (e.g. 20161126)” @ “Location (e.g. Meadowbrooke Farm)”

[ ] “Date (e.g. 20161126)” @ “Location (e.g. Meadowbrooke Farm)”

[ ] Include every additional Flight Test from this quarter here…

[ ] At the end of the quarter, please make a new copy user story 1082 – Social Media Updates for the next quarter.

**Notes**

* This is a quarter long commitment, please only pick it up if you can make the time.
* Every flight test for the quarter is to be included under Flight Test.
* Every video and photo needs to be in its best quality, meaning the videos are to be trimmed, and photos to be cropped if deemed necessary.
* Uploaded videos are automatically distributed into its perspective playlists if tagged correctly.
* Uploaded videos will automatically be shared through Twitter.
* Q&A about video tag: “school year (e.g. 20162017)” is considered from first day of summer courses of that year to the day before the first day of summer courses for the following year.
* **This is the original UserStory [Read-Only], please make a copy it of this at the end of every quarter. Delete this note in the new copy.**

## 1083 – Mission Planner Familiarization

**Content**

As a lab member, I would like to learn how to use Mission Planner.

**Definition of Done**

[ ] Familiarize with Mission Planner user interface and utilization

http://ardupilot.org/planner/docs/mission-planner-overview.html

\\FlightOperations\UAS\CommonDocuments\MissionPlanner\ OperationalChecklistsAndNotes.docx

[ ] Download Mission Planner

[ ] Load a TLog and a Waypoints file from a previous flight for reference

[ ] Successfully Connect to a vehicle via wired and wireless connection

[ ] Create a Waypoints file and test/verify before a flight test or with a senior member

[ ] Familiarize/Perform typical preflight calibrations with help from a senior member

[ ] Airspeed Sensor Calibration

[ ] Radio Transmitter Calibration

[ ] Accelerometer Calibration

[ ] Observe / Practice Data Technician procedures during Flight dates

[ ] Observe / Practice GCS operation / communication procedures during Flight dates

[ ] Familiarize with spotting and fixing errors in Mission Planner

[ ] Create and test a python script

**Notes**

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## 1084 – Part 107 Test Preparation (copy)

**Content**

Copy of user story 1352 – VTOL/QuadPlane**Error! Reference source not found.**

As a researcher, I would like to prepare for and take the FAA Part 107 Commercial Remote Pilot Certification test.

**Definition of Done**

[] Take the online course offered by the FAA

[] Take the three practice tests on the network drive

[] Study all topics identified as weak when taking practice tests

[] Take the part 107 test

[] Do the paperwork to get the license from the FAA

[] Do the paperwork to get reimbursed for test

**Notes**

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## 1085 – Unit Background Testing (copy)

See 006 – Software Developer Background Training (Algorithm and Back End)

See 132 – Unit Testing Beckground Training

**Notes**

Helpful Resources:

<https://www.youtube.com/watch?v=lisiwUZJXqQ> (90 min Crash Course)

<http://www.tutorialspoint.com/csharp/index.htm> (Good for referencing back to)

[https://www.edx.org/course/programming-c-microsoft-dev204x-2](https://www.edx.org/course/programming-c-microsoft-dev204x-2%20%20)  (Will need to sign in, Ends March 31st)

[https://mitseu.files.wordpress.com/2014/08/microsoft\_visual\_c-sharp\_\_2013\_step\_by\_step.pdf](https://mitseu.files.wordpress.com/2014/08/microsoft_visual_c-sharp__2013_step_by_step.pdf%20) (PDF book)

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## 1086 – Falco Pixhawk Assembly

**Content**

As a lab member, I would like to integrate the Pixhawk and its electronic components into Falco.

**Definition of Done**

[ ] Integrate Pixhawk, GPS, power module, I2C bus, airspeed sensor, RC Reciever and telemetry radio.

[ ] Ensure that all connections and components are secured with velcro if necessary.   
[ ] Ensure Falco connects to a transmitter and test control surfaces and throttle

[ ] Research parameters for Falco and write them to Pixhawk

**Notes**

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## 1087 – Falco Aircraft Manual (part 1)

**Content**

As a lab member, I would like write and publish an aircraft manual for Falco

**Definition of Done**

[ ] Write introductions, general information, performance, procedures for Falco.

[ ] Finish as much as possible before conducting an actual flight

[ ] Get approval from Hannah Rotta

**Notes**

* The manual is in \FlightOperations\UAS\Falco\FalcoAircraftFlightManual.docx

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## 1088 – Skywalker 1900 UAS Cradle

**Content**

As a lab member, I would like to assemble another cradle for the Skywalker 1900 UAS

**Definition of Done**

[ ] Gather measurement information of the Skywalker 1900 cradles in the lab

[ ] Gather PVC pipes and joints

[ ] Cut and assemble the pipes

[ ] Label joints and pipes for reassembly

[ ] Test with any Skywalker 1900 to ensure stability

**Notes**

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## 1089 – New AFSL Printer

**Content**

As a lab member, I would like to research and procure a new printer for the lab

**Definition of Done**

[ ] Search for a laser black printer online with Ethernet interface

[ ] Send printer information (URL) to Chris Lum for approval

**Notes**

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**1090 – JCATI 2015 KDLS Flight Demonstration**

**Content**

As a payload engineer, I would like to demonstrate the functionality of the TRAPIS payload and software suite with a fligh demonstration at the KDLS airport with our industry partners.

**Definition of Done**

[ ] Travel to The Dalles, OR from September 21, 2016 through September 23, 2016 for flight testing

[ ] Set up off-site ground station for test monitoring and aircraft operations

[ ] Meet with industry partners to discuss test plan and make necessary changes

[ ] Provide assistance with payload construction and implementation while in the field

[ ] Operate off-site ground station for use with all KDLS flight operations

[ ] Monitor tests and maintain communications with KDLS on-site ground crew

[ ] Conduct additional tests as necessary to gather all pertinent flight test data

[ ] Archive test results as required using pre-defined lab file infrastructure

[ ] Send printer information (URL) to Chris Lum for approval

**Notes**

* User story intended to capture field work done by KDLS flight team during JCATI 2015 flight demonstration

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**1091 – JCATI 2015 KDLS Flight Demonstration (Copy 1)**

**Content**

See user story **Error! Reference source not found.** 2015 KDLS Flight Demonstration

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**1092 – JCATI 2015 KDLS Flight Demonstration (Copy 2)**

**Content**

See user story **Error! Reference source not found.** 2015 KDLS Flight Demonstration

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**1093 – JCATI 2015 KDLS Flight Demonstration (Copy 3)**

**Content**

See user story **Error! Reference source not found.** 2015 KDLS Flight Demonstration

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**1094 – Set Up Radio Communication**

**Content**

As a lab member, I would like to Research and set up a radio communication option for use when out of range of cell service.

**Definition of Done**

[x] Determine a feasible communication option

[x] Order necessary parts

[x] Install in MFOC

[x] Test

**Notes**

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**1095 – Create a System to Track Parts**

**Content**

As a lab member, I would like to create a system to track lab components.

**Definition of Done**

[x] Create a spreadsheet to track components

[x] Begin Process of labelling parts

**Notes**

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**1096 – Create a System to Track Member Certifications**

**Content**

As a lab member, I would like to create a system to track member certifications and to make sure each member has completed the safety training and other key indoc items.

**Definition of Done**

[x] Create a spreadsheet to track members, which should include:

* lab safety agreement
* contact info
* facebook like
* certifications and expirations

**Notes**

This does not mean that all the lab member info is up to date

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**1097 – Lab Cleaning and Reorganization**

**Content**

As a lab member, I would like to clean up the lab.

**Definition of Done**

[x] Reorganize boxes, and relabel

[x] Move things into deep storage

**Notes**

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**1098 – Create a Training Program for Simulator**

**Content**

As a lab flight operator, I would like to create a training program for the simulator

**Definition of Done**

[ ] Create a method to log flight time

[ ] Determine minimum sim time before actual flight time

[ ] Standardize which airframes/settings are acceptable

**Notes**

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**1099 – Start a Maintenance Manager Spreadsheet**

**Content**

As a lab lab member, I would like to create a maintenance manager spreadsheet

**Definition of Done**

[ ] Create a spreadsheet that tracks critical items such as autopilots, transmitter, etc and note when they need periodic service or maintenance

**Notes**

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**1100 – Register Argo**

**Content**

As a lab flight operator, I would like to register Argo with the FAA

**Definition of Done**

[ ] Register Argo to obtain an N number, ICAO address

**Notes**

Talk to Dr. Lum

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**1101 – Establish Emergency Procedures for Lost-Link, etc**

**Content**

As a lab member, I would like to establish emergency procedures for aircraft

**Definition of Done**

[ ] Establish emergency procedures for lost-link, flyaway, etc

[ ] Integrate into checklists

[ ] Conduct training for all operators

**Notes**

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**1102 – Add Python Interpreter on AFSLPrecision02**

**Content**

As a lab member, I would like to add Python Interpreter on AFSLPrecision02

**Definition of Done**

[ ] Add interpreter

**Notes**

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**1103 – Wind Tunnel Deep Storage (Copy 1)**

**Content**

See user story 1078 – Wind Tunnel Deep Storage

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**1104 – Wind Tunnel Deep Storage (Copy 2)**

**Content**

See user story 1078 – Wind Tunnel Deep Storage

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**1105 – October Flight Operations**

**Content**

As a flight ops director, I would like to do the tasks required for successful flight operations.

**Definition of Done**

[x] Prepare monthly COA report

[x] Tour new lab members

[x] Battery charging

[x] Get new members set up in lab

[x] Battery safety and storage

[x] Component tracking

[x] Website Info

[x] Cleaning

**Notes**

* Updated as necessary

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**1106 – 3D Printing TEDD’s Camera Housing**

**Content**

As a manufacturing engineer, I would like to model and manufacture a camera housing for the Cannon SLA camera to install on TEDD.

**Definition of Done**

[x] Measure necessary dimensions on TEDD’s camera cutout and SLA camera

[x] Model design in CAD program

[x] Document updates to CAD program

[x] Print the model

[x] Test functionality

[ ] Secure the model so it will not shift during a flight

**Notes**

* CAD file created on 10/1/16
* Measurements in mm
* 10/4/16 Printed model

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## 1107 – Mapping Administration

**Content**

As a project manager, I would like to perform several administrative tasks during sprint 1610 to ensure that all mapping work is progressing appropriately during this sprint.

**Definition of Done**

[ ] Lead weekly mapping meeting

[ ] Create user stories for mapping tasks

[ ] Ensure mapping team is making progress on tasks

[ ] Ensure completetion of tasks end of sprint

[ ] Write brief description of mapping in AFSLProjects document

**Notes**

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**1108 – AIAA Conference Paper Draft Writing**

**Content**

As a student, I would like to summarize my research in a conference paper submission while working on relevant sections of my thesis so I can graduate

**Definition of Done**

[ ] Write relevant sections of thesis to be added to conference paper

[ ] Ensure conference submission draft is completed by 17 October

[ ] Ensure conference paper is submitted prior to the deadline of 24 October

**Notes**

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## 1109 – JCATI To-Do Items

**Content**

As a lab member, I need to prepare for the upcoming SDR flight and ground tests for the JCATI project.

**Definition of Done**

[ ] Determine the exact frequency of primary c2 transmitter

[ ] Obtain an Ethernet cable for the connection between GCS to GSN

[ ] Generate a master project vision document

[ ]Outline hardware components

[ ]Identify all wireless links: primary transmitter, 3dr radio, wifi, bladeRF, fpv, etc.

[ ]Identify nomenclature an dnames for all components and actors

[ ] Research picksi RTK

[ ] Update flight test cards

[ ] Different altititudes

[ ] Tripod on top of trailer

[ ] Update MARV AFM

[ ] Marco Polo tracker and arm/disarm procedure

[ ] Create ARGO AFM

[ ] Edit Noshad’s Document

[ ] ARGO indoor flight test

**Notes**

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## 1110 – JCATI To-Do Items (Copy)

**Content**

As a lab member, I need to prepare for the upcoming SDR flight and ground tests for the JCATI project.

**Definition of Done**

[ x] Determine the exact frequency of primary c2 transmitter

[ x] Obtain an Ethernet cable for the connection between GCS to GSN

[ ]x Generate a master project vision document

[x ]Outline hardware components

[ x]Identify all wireless links: primary transmitter, 3dr radio, wifi, bladeRF, fpv, etc.

[ x]Identify nomenclature an dnames for all components and actors

[ x] Update flight test cards

[ x] Different altititudes

[ x] Tripod on top of trailer

[ ] Update MARV AFM

[ ] Marco Polo tracker and arm/disarm procedure

[ x] Create ARGO AFM

[x ] Edit Noshad’s Document

[ ] ARGO indoor flight test

**Notes**

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## 1111 – ARGO Repair

**Content**

As a lab member, I need to diagnose the ARGO system failure and guarantee its airworthiness.

**Definition of Done**

[x ] Determine the cause of the system failure

[ x] Determine the extent of damage to the electrical system

[ x] Order and repair the fried connectors

**Notes**

The previously used battery had an inadequate discharge rating and was overdrawn when the props spun.

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## 1112 – ARGO Repair (Copy)

**Content**

As a lab member, I need to diagnose the ARGO system failure and guarantee its airworthiness.

**Definition of Done**

[ ] Determine the cause of the system failure

[ ] Determine the extent of damage to the electrical system

[ ] Order and repair the fried connectors

**Notes**

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## 1113 – Piksi RTK Flight Test

**Content**

As a lab member, I would like to work on setting up the Piksi real time kinematics location system and determine its feasibility for use with the JCATI Project.

**Definition of Done**

[ x] Locate documentation and become familiar with it

[ x] Perform ground tests

[ ] Complete 3d printed mounts and ground plates to minimize interference

[ ] Set up mission planner to accept piksi data

[ ] Complete a flight test

**Notes**

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## 1114 – MFOC Maintenance (part 1)

**Content**

As a lab member, I would like to work on the MFOC maintenance To-Do list

**Definition of Done**

[ ] Address MFOC maintenance to-do items

**Notes**

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## 1115 – CERES Hand Launch

**Content**

As a lab member, I would like to install handle bars beneath CERES to test the feasibility of hand launching Skywalker X8s.

**Definition of Done**

[ ] Install two handle bars beneath CERES

[ ] Ensure secure connection

[ ] Test the launching system on Rainier Vista

[ ] Obtain video footage of test launch

[ ] Launch CERES on the 10/29 excursion

**Notes**

See vidoes for proof of concept

a.       <https://www.youtube.com/watch?v=FopQaOeZvVY&feature=youtu.be>

b.      <https://www.youtube.com/watch?v=RWNp59af4NA&feature=youtu.be>

c.       <https://www.youtube.com/watch?v=KBIVaecTXgA&feature=youtu.be>

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## 1116 – Canon EOS and Canon Vixia Optical Settings

**Content**

As a mapping researcher, I would like to research and apply the most optimal settings on the Canon EOS and Canon Vixia to obtain clear photos and video footage

**Definition of Done**

[ ] TBD

**Notes**

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## 1117 – Mapping Software Research

**Content**

As a lab member, I would like to research different softwares that can be used to analyze mapping data.

**Definition of Done**

[ ] TBD

**Notes**

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## 1118 – Poaching Operations Research

**Content**

TBD

**Definition of Done**

[ ] TBD

**Notes**

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## 1119 – SLA-1500 Wireless Connection

**Content**

TBD

**Definition of Done**

[ ] TBD

**Notes**

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## 1120 – Falco Pixhawk Assembly (copy 1)

**Content**

As a lab member, I would like to integrate the Pixhawk and its electronic components into Falco.

**Definition of Done**

[ ] Integrate Pixhawk, GPS, power module, I2C bus, airspeed sensor, RC Reciever and telemetry radio.

[ ] Ensure that all connections and components are secured with velcro if necessary.   
[ ] Ensure Falco is connects to a transmitter and test control surfaces and throttle

[ ] Research parameters for Falco and write them to Pixhawk

**Notes**

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## 1121 – Falco Pixhawk Assembly (copy 2)

**Content**

As a lab member, I would like to integrate the Pixhawk and its electronic components into Falco.

**Definition of Done**

[ ] Integrate Pixhawk, GPS, power module, I2C bus, airspeed sensor, RC Reciever and telemetry radio.

[ ] Ensure that all connections and components are secured with velcro if necessary.   
[ ] Ensure Falco is connects to a transmitter and test control surfaces and throttle

[ ] Research parameters for Falco and write them to Pixhawk

**Notes**

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## 1122 – Falco Pixhawk Assembly (copy 3)

**Content**

As a lab member, I would like to integrate the Pixhawk and its electronic components into Falco.

**Definition of Done**

[ ] Integrate Pixhawk, GPS, power module, I2C bus, airspeed sensor, RC Reciever and telemetry radio.

[ ] Ensure that all connections and components are secured with velcro if necessary.   
[ ] Ensure Falco is connects to a transmitter and test control surfaces and throttle

[ ] Research parameters for Falco and write them to Pixhawk

**Notes**

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## 1123 – Trailer Tidying and Poster Hanging

**Content**

As a lab member, I would like to help organize the MFOC and Hang the sponsor poster in the lab space.

**Definition of Done**

[x] Remove non-essential equipment from trailer to deep storage in the wind tunnel.

[x] Hang sponsor poster in the lab with thumb tacks.

**Notes**

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## 1124 – Register Falco with FAA

**Content**

As a lab flight operator, I would like to register Falco with the FAA

**Definition of Done**

[ ] Register Falco to obtain an N number, ICAO address

**Notes**

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## 1125 – Request a Waiver for sUAS – Increase in Altitude

**Content**

As a lab flight operator, I would like to request a waiver for sUAS with the FAA so that I can increase the flight ceiling in Meadowbrook to 650 feet.

**Definition of Done**

[X] Coordinate with Chris Lum before starting this user story.

[ ] Read the form instructions (\FlightOperations\Research\FAA\instructions.pdf) and  the [list of regulations subject to waiver](https://www.faa.gov/uas/beyond_the_basics/#waiver) prior to filling the online form.

[ ] Filling the online form that is located at <https://www.faa.gov/uas/request_waiver/>.

[ ] Discuss the drafted form with lab members before submitting.

[ ] Submit the revised form.

**Notes**

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## 1126 – Request a Waiver for sUAS – Increase in Altitude (Copy)

**Content**

As a lab flight operator, I would like to request a waiver for sUAS with the FAA so that I can increase the flight ceiling in Meadowbrook to 650 feet.

**Definition of Done**

[X] Coordinate with Chris Lum before starting this user story.

[ ] Read the form instructions (\FlightOperations\Research\FAA\instructions.pdf) and  the [list of regulations subject to waiver](https://www.faa.gov/uas/beyond_the_basics/#waiver) prior to filling the online form.

[ ] Filling the online form that is located at <https://www.faa.gov/uas/request_waiver/>.

[ ] Discuss the drafted form with lab members before submitting.

[ ] Submit the revised form.

**Notes**

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## 1127 – Flight Training Program

**Content**

As a future sUAS pilot, I would like to complete the AFSL required training to become eligible to fly the lab’s aircraft.

**\*\*Flight training must be taken seriously. At some point you could be asked to safely takeoff, fly and land a $10,000 sensor in less than ideal weather, so you need to be ready to meet this challenge whenever it arises\*\***

**Definition of Done**

[ ] Before anything else, read the training information located here: **\FlightOperations\Operators\Training\FlightTrainingInformation.docx**.

[ ] Discuss reading with Hannah Rotta before moving on.

[ ] Log at least three hours of *productive* simulator time on PhoenixRC on the computer nearest the door. Please use the **Multiplex EasyStar AFSL\_Skywalker\_Trainer** model (listed under the favorites – this is important because the version that doesn’t say AFSL\_Skywalker\_Trainer does not have ailerons). Additional time may be spent on other airframes, but a minimum three hours on the EasyStar are required. This includes the following:

[x] Log at least three hours here in the gray section of this document: **\FlightOperations\Operators\Training\FlightTrainingRecords.xlsx**

[x] Practice flying a basic traffic pattern

[x] Practice reverse orientation flying

[x] Perform 15 safe landings on a Dead Calm day (weather can be adjusted in the settings)

[x] Perform 15 safe landings on a Brisk day

[x] Perform 15 safe landings on a Fair Wind day

[ ] Demonstrate to a lead pilot proficiency on takeoff, cruise, reverse orientation and landing

[ ] Fly Anakin with buddy box system in the field and complete or show proficiency in the following:

[ ] Three successful takeoffs

[ ] Reverse orientation

[ ] Cruise in manual mode

[ ] Cruise in stabilize mode

[ ] RTL mode

[ ] Three successful landings

[ ] Log all time here in the blue section: **\FlightOperations\Operators\Training\FlightTrainingRecords.xlsx**

[ ] Receive approval for fixed wing solo flight

**Notes**

* Rotor flight will require rotor specific training

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## 1128 – MFOC Maintenance (copy)

**Content**

See user story 1114 – MFOC Maintenance

**Notes**

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## 1129 – Perforce Visual Client (copy)

**Content**

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**Definition of Done**

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**Notes**

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**1130 – FPV Camera for TEDD**

**Content**

As a lab researcher, I would like to research and install a FPV camera on TEDD.

**Definition of Done**

[ ]Research the FPV camera, setup and system in a sUAV  
[ ]Create a list of items for procurement  
[ ]Install FPV camera on TEDD  
[ ]Test camera during a flight test

**Notes**

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**1131 – MOFC 3D Printing**

**Content**

As a lab researcher, I would like to reprint the MFOC hole cover to be able to route wires through the hole without removing the cover.

**Definition of Done**

[ ] Edit the Solidworks model to have a cable access.

[ ] Print model.

[ ] Outfit model with weatherstripping.

**Notes**

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**1132 – SLA-1500 Gimbal Research**

**Content**

As a lab researcher, I would like to research the feasibility of installing the SLA-1500 camera onto a 3 axis rotation gimbal.

**Definition of Done**

TBD

**Notes**

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## 1133 – Perforce Visual Client (copy)

**Content**

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**Definition of Done**

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**Notes**

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## 1134 – Part 107 Test Preparation (Copy)

**Content**

* See 1055 – Part 107 Test Preparation

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## 1135 – GROVER Maintenance

**Content**

As a lab member, I need to fix GROVER for ‘flight-ready’ capability

**Definition of Done**

[ ] Determine the cause of the FPV gimbal not responding correctly

[ ] Fix or replace broken servos / Fix Transmitter or Pixhawk settings

[ ] Document Fixes at

\FlightOperations\UAS\GROVER\ConstructionAndMaintenenceLog.docx

**Notes**

**This UserStory will be an ongoing event to cover GROVER issues**

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## 1136 – Perforce Visual Client (copy)

**Content**

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## 1137 – Perforce Visual Client (copy)

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## 1138 – Perforce Visual Client (copy)

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## 1139 – Perforce Visual Client (copy)

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## 1140 – Perforce Visual Client (copy)

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## 1141 – Perforce Visual Client (copy)

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## 1142 – Perforce Visual Client (copy)

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## 1143 – Perforce Visual Client (copy)

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## 1144 – Perforce Visual Client (copy)

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## 1145 – Perforce Visual Client (copy)

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## 1146 – Perforce Visual Client (copy)

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## 1147 – Perforce Visual Client (copy)

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## 1148 – Perforce Visual Client (copy)

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**Definition of Done**

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**Notes**

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## 1149 – Creating an Angled Platform for Object Detection

**Content**

As a member of the Mapping team, I would like to create an angled platform on the trailer for us to detect data when we do test flights at different angles. This would give us a wider range of data when we do volumetric analysis for objection detection.

**Definition of Done**

[ ] Find if any similar systems to the proposed product is currently in use

[ ] Create an platform that can vary from 30-60-90 degrees.

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## 1150 – Volumetric Analysis

**Content**

As a member of the Mapping team, I would like to create an experiment and do analysis on the data collected during test flights. I want to be able to do volumetric analysis in order to see if the objects detected using Micasense can tell us what kind of object and how much volume the aerial data (DSM) will show us. I want to accomplish this through Matlab.

**Definition of Done**

[ ] Convert Tif files to Grd files

[ ] Work on Matlab script

[ ] Figure out what parameters are needed

[ ] Collect data from the flight testing of objects at varying degrees

[ ] Design the experiment

**1151 – Investiagation of Mission Planner’s swarm capabilities**

**Content**

As a lab researcher, I would like to research, summarize, and present the Capability of Mission Planner and other Software for Swarm control.

**Definition of Done**

 [ ] Investigate whether Mission Planner can control a swarm of multiple UAVs

        [ ] How would this work?

        [ ] Would the aircraft be able to operate individually or would they follow the same flight paths?

[ ] Investigate the details of using Mission Planner to control multiple UAVs

        [ ] How would we create flight paths for aircraft?

        [ ] Could we still use the standard 915 MHz telemetry?

        [ ] How reliable would this be?

        [ ] Would any programming be required?

[ ] Investigate alternative software for swarm control

        [ ] Investigate and record the details of alternative software

[ ] How does swarm operation fit into Part 107 regulations?

[ ] Compile and summarize all information into a presentation detailing answers to the above questions

         [ ] Presentation should include a comparison of other 'Swarm-control' software and Mission Planner

[ ] Discuss findings with Zach, Connor, and Dr. Lum

[ ] Present results to the group at the research meeting

**Notes**

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**1152 – Write SAM Aircraft Flight Manual**

**Content**

As a lab member, I would like to write the AFM for SAM.

**Definition of Done**

[ ] Write a complete AFM for the new plane

**Notes**

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**1153 – Airworthiness for SAM**

**Content**

As a lab member, I would like to make sure that the new plane, SAM, is airworthy and ready to fly.

**Definition of Done**

[ ] Become familiar with pre-installed hardware on SAM

[ ] Determine what it will take to make sure it is compatible to fly with our current systems

[ ] Do what it takes to get SAM ready for a flight test, which could include:

* Check all current systems

[ ] Talk to Dr. Lum about getting it registered with the FAA

[ ] Write a test card for initial flight test

[ ] Brainstorm ideas for how AFSL can best use this airframe, primarily for mapping

**Notes**

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**1154 – AIAA Conference Paper Draft Writing (copy)**

**Content**

As a student, I would like to summarize my research in a conference paper submission while working on relevant sections of my thesis so I can graduate

**Definition of Done**

[ ] Write relevant sections of thesis to be added to conference paper

[ ] Ensure conference submission draft is completed by 17 October

[ ] Ensure conference paper is submitted prior to the deadline of 24 October

**Notes**

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**1155 – AIAA Conference Paper Draft Writing (copy)**

**Content**

As a student, I would like to summarize my research in a conference paper submission while working on relevant sections of my thesis so I can graduate

**Definition of Done**

[ ] Write relevant sections of thesis to be added to conference paper

[ ] Ensure conference submission draft is completed by 17 October

[ ] Ensure conference paper is submitted prior to the deadline of 24 October

**Notes**

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**1156 – ARGO Gimbal Construction**

**Content**

As a lab member, I’d like to construct the gimbal meant for ARGO and calibrate it.

**Definition of Done**

[x ] Construct the frame and attach motors

[ ] Determine the correct software to use for interfacing with the control board

[ ] Calibrate the control board

[ ] Integrate with the pixhawk so that the pilot is able to control it with the primary or a secondary transmitter

**Notes**

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**1157 – Invesitage LIDAR Feasiblity**

**Content**

As a lab member, I would like to look into using lidar as a possible mapping payload for ARGO

**Definition of Done**

[X] Look into the precedence of using Lidar on small UAV systems

[X] Research possible applications of this technology

[X] Discuss your findings with Dr. Lum, Connor, Zach and Scott

**Notes**

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**1158 – ARGO Interchangeable Payload Mount**

**Content**

As a lab member, I want to design and construct a mount that would be able to accept multiple payloads.

**Definition of Done**

[ ] Design a tray that could securely hold the bladeRF during flight tests

[ ] Design a tray that would allow the gimbal to use the mount

[ ] Ensure that the mount would allow for payloads to be quickly swapped using quick releases

[ ] Construct the trays

[ ] Construct the mount and attach it to ARGO

[ ] Make sure that adequate documentation is added to perforce

**Notes**

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**1159 – Additional Multi-Rotor research**

**Content**

As a lab member, I would like to research additional multi rotor frames for use in a swarm

**Definition of Done**

[ ] Research different types of multi-rotor frames

[ ] Build from scratch or buy an assembled kit?

[ ] How many rotors? What size should it be?

[ ] The multi rotor should be versatile and able to be used with multiple projects

[ ] Determine what flight characteristics are required for multi rotors in a swarm

[ ] Present your findings to Dr. Lum and the multi rotor team

**Notes**

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**1160 – Props for Flight Tests**

**Content**

As a lab member, I would like to research and procure props for Vulcan flight tests.

**Definition of Done**

[ ] Research poaching tactics, and accessories

[ ] Determine what props would be valuable to have for our flight tests to accurately simulate a poaching environment

[ ] Find where these items can be procured from and obtain them

[ ] Talk to Dr. Lum about budgeting

**Notes**

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**1161 – Vulcan Test Matrix**

**Content**

As a lab member, I would like to develop a test matrix for tests to run for detecting poachers for the upcoming flight tests.

**Definition of Done**

[ ] Based on poaching tactics, determine the parameters that can be changed to set up a test plan for using Vulcan’s camera

[ ] Write test cards based on these parameters

**Notes**

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**1162 – Airworthiness for SAM (copy)**

**Content**

Copy of user story 1153 – Airworthiness for SAM

**Definition of Done**

Copy definition from user story 1153 – Airworthiness for SAM

**Notes**

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**1163 – Flight Ops Administration (11/2016)**

**Content**

As flight operations director, I would like to complete the following tasks to administrate flight operations.

**Definition of Done**

[ ] Update Talon AFM

[ ] Organize training flights

[ ] Ben airworthiness

[ ] Check over Vulcan contract

[ ] Oversee altitude waiver

[ ] Oversee Argo tent test

**Notes**

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## 1164 – Arduino with Matlab and Simulink (Position 3)

See ‘1022 – Arduino with Matlab and Simulink’

## 1165 – Arduino with Matlab and Simulink (Update Documentation) (Position 3)

1023 – Arduino with Matlab and Simulink (Update Documentation)

**1166 – Luke Post-Mortem Analysis**

**Content**

As lab member, I would like to conduct a Luke post-mortem analysis to determine what the cause of failure was.

**Definition of Done**

[ ] Systematically determine what went wrong

[ ] Investigate each part to see if it is working properly

* + be sure to mark broken ones on inventory log: \FlightOperations\UAS\ComponentTracker.xlsx

[ ] Investigate the data logs for clues

[ ] Release back into circulation any components that are working and undamaged

[ ] Report to stakeholders of findings so crash isn’t repeated

**Notes**

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**1167 – Arduplane SITL Validation**

**Content**

As a lab member, I would like to test the UW custom arduplane by doing a SITL test in mission planner.

**Definition of Done**

[] Install all necessary software to complete test

[] Make sure custom arduplane code is running properly in SITL test

[] Make sure UW mode 2 (SITL Visual Anchoring Mode) is working properly in SITL test

**Notes**

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**1168 – CONDOR Post-Mortem Analysis**

**Content**

As lab member, I would like to conduct a CONDOR post-mortem analysis to determine what the cause of failure was.

**Definition of Done**

[ ] Systematically determine what went wrong

[ ] Investigate each part to see if it is working properly

* + be sure to mark broken ones on inventory log: \FlightOperations\UAS\ComponentTracker.xlsx

[ ] Investigate the data logs for clues

[ ] Release back into circulation any components that are working and undamaged

[ ] Report to stakeholders of findings so crash isn’t repeated

**Notes**

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**1169 – Understand Image Processing Matlab Code**

**Content**

As lab member, I would like to go through the Image Processing matlab code on perfoce and try to understand/document how the algorithm works.

**Definition of Done**

[] Understand the image processing algorithm that take inputs of images and outputs slant range to target on image

[] Help document code to help others understand the process

**Notes**

**1170 – FPV Camera Research for Skywalker X8**

**Content**

As lab member, I would like to research the variety of FPV cameras that we can use on a Skywalker X8.

**Definition of Done**

TBD

**Notes**

## 1171 – New AFSL Printer (copy)

**Content**

As a lab member, I would like to research and procure a new printer for the lab

**Definition of Done**

[x] Search for a laser black printer online with Ethernet interface

[x] Send printer information (URL) to Chris Lum for approval and purchase

[x] Set up printer with all lab desktops, including getting a static IP address from UW IT.

[x] Add printer documentation and instructions to Perforce

**Notes**

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**1172 – AIAA Conference Paper Draft Writing (copy)**

**Content**

As a student, I would like to summarize my research in a conference paper submission while working on relevant sections of my thesis so I can graduate

**Definition of Done**

[ ] Write relevant sections of thesis to be added to conference paper

[ ] Ensure conference submission draft is completed by 17 October

[ ] Ensure conference paper is submitted prior to the deadline of 24 October

**Notes**

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**1173 – AIAA Conference Paper Draft Writing (copy)**

**Content**

As a student, I would like to summarize my research in a conference paper submission while working on relevant sections of my thesis so I can graduate

**Definition of Done**

[ ] Write relevant sections of thesis to be added to conference paper

[ ] Ensure conference submission draft is completed by 17 October

[ ] Ensure conference paper is submitted prior to the deadline of 24 October

**Notes**

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**1174 – AIAA Conference Paper Draft Writing (copy)**

**Content**

As a student, I would like to summarize my research in a conference paper submission while working on relevant sections of my thesis so I can graduate

**Definition of Done**

[ ] Write relevant sections of thesis to be added to conference paper

[ ] Ensure conference submission draft is completed by 17 October

[ ] Ensure conference paper is submitted prior to the deadline of 24 October

**Notes**

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**1175 – AIAA SciTech Conference Paper Draft Writing**

**Content**

As a student, I would like to summarize my research in a conference paper submission while working on relevant sections of my thesis so I can graduate

**Definition of Done**

[ ] Write relevant sections of thesis to be added to conference paper

[ ] Ensure mathematical modeling for estimators is sound within flight tracking context

[ ] Ensure draft is completed before the end of autumn quarter 2016 (9 Dec 2016)

**Notes**

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**1176 – Flight Training Program**

**Content**

Copy of user story **Error! Reference source not found.**t Training Program

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.** Training Program

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**1177 – Image Processing 1: slant range algorithm**

**Content**

As a developer and researcher in working on Visual Anchoring project, I’d like to develop and test a computer vision algorithm that can calculate the slant range between each pixel to camera.

**Definition of Done**

[X] Research online and look for approaches

[X] Evaluate the plausible approaches

* Using Triangle Similarity
* Using Camera Intrinsic Matrix

[X] Write up/ construct the mathematical model

[X] Test the algorithm with test pictures

[X] Document the model for record and future reference

**Note**

This is the part 1 of a (currently) 4-part series image processing application project. Image processing application is part of the Visual Anchoring project.

**Finish Note:**

Since the actual size of our target is often inacquirable in our applications,

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**1178 – Image Processing 2: fit slant range algorithm to tracking algorithm**

**Content**

As a developer and researcher in working on Visual Anchoring project, I’d like to put developed algorithm that calculates slant range in the object following code, so that the algorithm can calculate slant range in real time while tracking the target.

**Definition of Done**

[ ] Revisit object following code, discover where the code can be best plugged in

[ ] Revise slant range code accordingly to fit into object following code

[ ] Test the new object following algorithm on test footage

**Note**

This is the part 2 of a (currently) 4-part series image processing application project. Image processing application is part of the Visual Anchoring project.

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**1179 – Image Processing 3: automate the algorithm**

**Content**

As a developer and researcher in working on Visual Anchoring project, I’d like to research whether there’s a way to automatically start the algorithm and track the target.

**Definition of Done**

[ ] Research on the possibility to automate the algorithm

* For example, first take a picture of the target, then add a feature matching algorithm to existing code. When the feature matching algorithm is triggered, the tracking algorithm is waken up and starts operate.
* The benefit is that the operator don’t need to manually select the object to track in operation time.

[ ] Develop a possible model for it

[ ] Test the modified algorithm with test footage

**Note**

This is the part 3 of a (currently) 4-part series image processing application project. Image processing application is part of the Visual Anchoring project.

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**1180 – Image Processing 4: field test & finalize**

**Content**

As a developer and researcher in working on Visual Anchoring project, I’d like to conduct a field test on the capability of the improved object following algorithms.

**Definition of Done**

[ ] Discuss with Prof. Lum on arranging a field test for the algorithm

[ ] Conduct the test

[ ] Write a report on the test result

[ ] Modify/improve the algorithm base on the test feedback

**Requirements for the Final Result**

[ ] The image processing system shall consume live video imagery from the aircraft and compute the slant range at a rate of 1Hz or better.

[ ] The slant range measurements shall be 15% accurate.

[ ] The system shall be implemented on the AFSL\_CONDOR computer.

[ ] The image processing system shall be tested in a minimum of least 2 live flight tests.

[ ] The system shall be demonstrable using pre-recorded video footage as input.

**Note**

This is the part 4 of a (currently) 4-part series image processing application project. Image processing application is part of the Visual Anchoring project.

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**1181 – Flight Training Program**

**Content**

Copy of user story **Error! Reference source not found.**t Training Program

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.** Training Program

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**1182 – Maintenance of Training Planes (Position 1)**

**Content**

As a flight operations member, I would like to check the airworthiness of planes used for training.

**Definition of Done**

**For DubCub and Ben**

[x] Ensure structural soundness of each plane

[x] checked if each component needing replacing

[x] Inventory parts

[x] Bind to a receiver

**Note**

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**1183 – Maintenance of Training Planes (Position 2)**

**Content**

Copy of user story 1182 – Maintenance of Training Planes (Position 1)

**Definition of Done**

Copy of user story 1182 – Maintenance of Training Planes (Position 1)

**Note**

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## 1184 – Turnigy Talon Tricopter (T3) Build

**Content**

As a UAS operator, I would like to build the Turnigy Talon Tricopter (T3) so I can use it for demonstration purposes as well as research and testing.

**Definition of Done**

[ ] Coordinate with Chris Lum before starting this story

[ ] Coordinate with Yifu before starting this story.

[ ] Build the Turnigy Talon Tricopter and make it airworthy. Some subsystem to consider include but are not limited to:

[ ] ESC

[ ] Battery switches

[ ] Pixhawk mini

[ ] Video Tx

[ ] Camera

[ ] Review final product with Chris Lum.

[ ] Come up with a name for the system

[ ] Document all construction in appropriate location.

[ ] Present results to research group.

[ ] Conduct flight tests.

[ ] Additional tasks TBD

**Notes**

* See build notes for MARV.

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## 1185 – Request a Waiver for sUAS – Increase in Altitude (copy)

**Content**

As a lab flight operator, I would like to request a waiver for sUAS with the FAA so that I can increase the flight ceiling in Meadowbrook to 650 feet.

**Definition of Done**

[x] Coordinate with Chris Lum before starting this user story.

[x] Read the form instructions (\FlightOperations\Research\FAA\instructions.pdf) and  the [list of regulations subject to waiver](https://www.faa.gov/uas/beyond_the_basics/#waiver) prior to filling the online form.

[x] Filling the online form that is located at <https://www.faa.gov/uas/request_waiver/>.

[x] Discuss the drafted form with lab members before submitting.

[x] Submit the revised form.

**Notes**

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## 1186 – HiLPixhawk Maintenance

**Content**

As a researcher, I would like to prepare HiLPixhawk1 to be airworthy.

**Definition of Done**

[X] Coordinate with Chris Lum before starting this user story.

[x] Load ArduCopter firmware

[x] Calibrate Accelerometer and GPS

[x] Test if Dataflash logs and telemetry logs can be recorded

[ ] Inventory the parts

**Notes**

* Dataflash logs cannot be recorded despite loading MARV parameters and changing the specific logging parameters in Mission Planner

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## 1187 – Visual Anchoring White Paper

**Content**

As a researcher, I would like to develop a white paper for the visual anchoring project in order to get funding for future research.

**Definition of Done**

[] Use the example white paper to create a draft for the visual anchoring project through March 2018

[] Submit draft to Dr. Lum and revise as necessary

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## 1188 – Understand Original Image Processing Algorithm

**Content**

As a researcher developing an improved version of image processing project, I would like to have a deep grasp of the original image processing algorithm and figure out how to best induce changes

**Definition of Done**

[X] Throughly read and understand the image processing algorithm on Conference Paper

[X] Throughly read the code and understand where needs to change and where can remain unchanged

[X] Discuss with other collaborators to figure out unclear parts

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## 1189 – Integrate Tracking and Image Processing Algorithms

**Content**

As a researcher, I would like to integrate the image tracking and image processing algorithms that track objects and find the slant ranges of targets in the image frame respectively.

**Definition of Done**

[] Verify that image tracking code properly works

[] Verify that slant range image processing code properly works

[] Verify that the both codes work after integration with similar tests

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## 1190 – Custom Arduplane build with UW modes

**Content**

As a researcher, I would like to make a custom build of Arduplane with UW modes 1-4. I would also like to validate the orbit controllers used in the UW modes.

**Definition of Done**

[] Verify that the orbit controllers work properly in SITL

[] Verify that the orbit controllers work properly by testing with image processing algorithms

[] Make a custom build of Arduplane to upload to Rebuilt CONDOR for ground testing

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## 1191 – Prepare Rebuilt CONDOR for ground testing

**Content**

As a researcher, I would like to finish rebuilding CONDOR and prepare it for ground testing.

**Definition of Done**

[] Work with Mike Brady to finish the rebuild of CONDOR

## 1192 – Mission Planner Familiarization (copy)

**Content**

Copy of user story 1083 – Mission Planner Familiarization

As a lab member, I would like to learn how to use Mission Planner.

**Definition of Done**

[ ] Familiarize with Mission Planner user interface and utilization

http://ardupilot.org/planner/docs/mission-planner-overview.html

\\FlightOperations\UAS\CommonDocuments\MissionPlanner\ OperationalChecklistsAndNotes.docx

[ ] Download Mission Planner

[ ] Load a TLog and a Waypoints file from a previous flight for reference

[ ] Successfully Connect to a vehicle via wired and wireless connection

[ ] Create a Waypoints file and test/verify before a flight test or with a senior member

[ ] Familiarize/Perform typical preflight calibrations with help from a senior member

[ ] Airspeed Sensor Calibration

[ ] Radio Transmitter Calibration

[ ] Accelerometer Calibration

[ ] Observe / Practice Data Technician procedures during Flight dates

[ ] Observe / Practice GCS operation / communication procedures during Flight dates

[ ] Familiarize with spotting and fixing errors in Mission Planner

[ ] Create and test a python script

**Notes**

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## 1193 – ARGO “Training Wheels”

**Content**

As a lab member, I would like to build a mechanism to increase the safety of Argo landings.

**Definition of Done**

[ ] Design a “training wheels” platform for Argo (ex PVC pipe)

[ ] Determine the necessary materials

[ ] Build platform

[ ] Test in flight

**Notes**

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## 1194 – Soldering

**Content**

As a lab member, I would like to solder a battery and telemetry wire for SAM.

**Definition of Done**

[x] Solder battery

[ ] Solder wires to increase length

**Notes**

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## 1195 – LinkedIn Page Setup and Facebook Link

**Content**

As a lab member, I would like to create a LinkedIn Page for the AFSL and link it to the AFSL Facebook Page.

**Definition of Done**

[ ] Create a test LinkedIn Page to see how the features work

[ ] Link the test LinkedIn Page to a test Facebook page

[ ] Contact Dr. Lum to discuss research results

[ ] Given Dr. Lum’s permission, set up the real LinkedIn Page for the AFSL lab

[ ] Link the Facebook Page to the AFSL lab

[ ] Post on Facebook Page that the AFSL lab has a LinkedIn Account

**Notes**

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## 1196 – GROVER Research – Mission Planner and Python Scripts

**Content**

As a lab member, I will begin looking at using Mission Planner to communicate GPS coordinates between a UAV and GROVER.

**Definition of Done**

[ ] Be able to load and run python scripts on Mission Planner

[ ] Inform Zach about result of scripts

[ ] Discuss next steps with Zach

**Notes**

While using Mission Planner is the ideal way to communicate GPS coordinates between GROVER and a UAV, there might be alternate ways to do this. In addition, research into how many computers are needed to communicate these coordinates are also part of this story.

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**1197 – Master’s Thesis Rough Draft (Larson)**

**Content**

As a student, I would like to write my Master’s thesis so I can graduate.

**Definition of Done**

[ ] Write rough draft of Master’s thesis

**Notes**

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**1198 – Master’s Thesis Revisions (Larson)**

**Content**

As a student, I would like to write my Master’s thesis so I can graduate.

**Definition of Done**

[ ] Revise thesis rough draft per comments from committee members.

**Notes**

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**1199 – Master’s Thesis Presentation (Larson)**

**Content**

As a student, I would like to write my Master’s thesis so I can graduate.

**Definition of Done**

[ ] Polish thesis as necessary

[ ] Present thesis results at department wide meeting/presentation on (date TBD)

[ ] Obtain all necessary signatures and documents required for graduation

**Notes**

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**1200 – Master’s Thesis Polishing (Larson)**

**Content**

As a student, I would like to write my Master’s thesis so I can graduate.

**Definition of Done**

[ ] Revise thesis rough draft per comments from committee members.

[ ] Clean up figures, double check calculations, verify correct citations, etc.

**Notes**

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**1201 – Flight Training Program**

**Content**

Copy of user story **Error! Reference source not found.**t Training Program

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.** Training Program

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## 1202 – Flight Instruction

**Content**

As a remote pilot, I would like to train others to fly the fixed wing aircraft in the lab.

**Definition of Done**

[x] Do what it takes to comfortably approve others for solo flight operations in the lab

**Notes**

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## 1203 – MFOC Maintenance (part 2)

**Content**

As a lab member, I would like to work on the MFOC maintenance To-Do list

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

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## 1204 – Student Technology Fee Proposal (copy) – LIDAR

**Content**

Copy of user story 479 – Student Technology Fee Proposal

As a project manager, I would like to submit a proposal to the UW Student Technology Fee to see if we can obtain funding for some of our purchases.

**Definition of Done**

[x] Coordinate with Chris Lum before starting this story.

[x] Read about the STF proposal process at <https://techfee.washington.edu/>

[x] Read past successful proposals in related areas. Two from David Shean are

[x] <https://techfee.washington.edu/proposals/2013-079/>

[x] <https://techfee.washington.edu/proposals/2014-059/>

[x] Coordinate with Eleanor Forbes and get her advice on successful proposals to the STF.

[x] Add additional tasks to this user story as appropriate (for example obtaining relevant student testimonials and department support)

[x] Ensure that deadline for the proposal is being tracked by Chris Lum

[x] Create a list of equipment to ask for and create an appropriate budget.

[x] Obtain signatures

[x] Author

[x] Main Contact

[x] Budget Contact

[x] Dean Contact

[x] Create proposal and get this reviewed with Hannah and Chris.

[x] Submit the proposal.

**Definition of Done**

Copy definition of done from user story 479 – Student Technology Fee Proposal

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## 1205 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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**1206 – Flight Ops Administration (12/2016)**

**Content**

As flight operations director, I would like to complete the following tasks to administrate flight operations.

**Definition of Done**

[ ] Coordinate and administrate flight tests

**Notes**

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## 1207 – AFSL Website Updates (People Section) (copy) – AUT ‘16

**Content**

Copy of user story 495 – AFSL Website Updates (People Section)

As a marketing agent, I would like to update the AFSL website “People” section with new information so I can publicize our activities.

**Definition of Done**

[x] Coordinate with Chris Lum before starting this user story.

[ ] Update the “People” section

[x] Wipe all student researchers

[x] Keep Directors and Affiliate Directors

[x] Obtain photos and short bios of all active members

[x] Remove all inactive members to past researchers section

[x] Determine where old members are now and update/highlight success stories

[x] Capitalize design, build, fly in Chris Lum description

[x] Take out spacing between email and phone number under Directors

[x] Check with Chris Lum if we need to include Sponsors and special thanks (e.g. recent UAV donation)

[x] Review all materials with Chris Lum

[x] Gain student editing access from Kevin Ward

[x] Ensure that changes are made and correct on the final website.

[x] When the user story is coming to 100% completion, please make a new copy of this userstory for the next quarter/year.

**Notes**

* All website material is located in [\\AFSL\WebsiteInfo](file:///\\AFSL\WebsiteInfo)
* Coordinate with development champion for user story ‘**Error! Reference source not found.**’ (the parent user story for this current story) only if this is part of a large update.

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## 1208 – AFSL Website Updates (Facilities Section) (copy) – WIN ‘17

**Content**

Copy of user story 496 – AFSL Website Updates (Facilities Section)

As a marketing agent, I would like to update the AFSL website “Facilities” section with new information so I can publicize our activities.

**Definition of Done**

[ ] Coordinate with Chris Lum before starting this user story.

[ ] Update the “Facilities” section

[ ] Get pictures and write a description of KWT102 and GUG104 (manufacturing facilities)

[ ] Get pictures and write a description of AERB139 (lab space)

[ ] Get pictures and write descriptions of the TEDD and CONDOR systems (including ground station and recovery system).

[ ] Obtain a picture of all 3 aircraft next to each other.

[ ] Get pictures and write descriptions of the multi-computer simulator setup.

[ ] Review all materials with Chris Lum

[ ] Send mock ups to Kevin Ward.

[ ] Ensure that changes are made and correct on the final website.

**Notes**

* All website material is located in [\\AFSL\WebsiteInfo](file:///\\AFSL\WebsiteInfo)
* Coordinate with development champion for user story ‘**Error! Reference source not found.**’ (the parent user story for this current story) only if this is part of a large update.

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## 1209 – AFSL Website Updates (Research Section) (copy) – WIN ‘17

**Content**

Copy of user story 497 – AFSL Website Updates (Research Section)

As a marketing agent, I would like to update the AFSL website “Research” section with new information so I can publicize our activities.

**Definition of Done**

[ ] Coordinate with Chris Lum before starting this user story.

[ ] Update the “Research” section

[ ] Include Most Revelant UAVs (e.g. TEDD, etc.)

[ ] Include a Photo

[ ] Write a Description

[ ] Include Current Projects (newest on top)

[ ] Include a Photo

[ ] Write a Description

[ ] Write a project description for JCATI 2016 (check with Chris)

[ ] Write a project description for Visual Anchoring (check with Chris)

[ ] Write a project description for MAPPS (check with Chris)

[ ] Write a project description for Quad Plane (check with Chris)

[ ] Write a project description for Mapping (check with Chris)

[ ] Review all materials with Chris Lum

[ ] Send mock ups to Kevin Ward.

[ ] Ensure that changes are made and correct on the final website.

**Notes**

* All website material is located in \\AFSL\WebsiteInfo
* The IEEE paper which outlines all of the work from the JCATI project is located in [\\JCATI2013\TechnicalDataPackage\IEEE Paper\CompiledVersions\MAIN\_collision\_awareness\_plugin.pdf](file:///\\JCATI2013\TechnicalDataPackage\IEEE%20Paper\CompiledVersions\MAIN_collision_awareness_plugin.pdf)

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## 1210 – AFSL Website Updates (Publications Section) (copy) – WIN ‘17

**Content**

Copy of user story 498 – AFSL Website Updates (Publications Section)

As a marketing agent, I would like to update the AFSL website “Publications” section with new information so I can publicize our activities.

**Definition of Done**

[ ] Coordinate with Chris Lum before starting this user story.

[ ] Update the “Publications” section

[ ] Flatten research structure (no more strategic, tactical, dynamics level organization)

[ ] Add new publications.

[ ] Review all materials with Chris Lum

[ ] Send mock ups to Kevin Ward.

[ ] Ensure that changes are made and correct on the final website.

**Notes**

* All website material is located in [\\AFSL\WebsiteInfo](file:///\\AFSL\WebsiteInfo)
* Coordinate with development champion for user story ‘**Error! Reference source not found.**’ (the parent user story for this current story) only if this is part of a large update.

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## 1211 – Investigate Pixhawk 2

**Content**

As a researcher, I would like to investigate the Pixhawk 2.

**Definition of Done**

[ ] Review the following documents:

* <http://www.proficnc.com/>
* <http://ardupilot.org/dev/docs/intel-edison.html>

[ ] Review any other relevant documentation

[ ] Determine the pros, cons and possible uses

[ ] Report results to Dr. Lum

**Notes**

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## 1212 – Flight Test Media Coverage

**Content**

As a lab member, I would like to photograph and video tape the flight test on “Date (e.g. 20161126)” @ “Location”.

**Definition of Done**

[ ] Change heading to “User Story ID” – Flight Test Media Coverage (copy) – “Date of Flight Test (e.g. 20161126)”

[ ] Attend the flight test on “Date (e.g. 20161126)” @ “Location (e.g. Meadowbrooke Farm)”

[ ] Photograph the white board with the new run number before every test run.

[ ] Videotape every test run of the flying aircraft.

[ ] Make sure to capture the flight tests (number one priority)

[ ] Also capture participants, activities, etc. that can be uploaded onto Facebook

[ ] Upload the files to K drive.

[ ] Sort the media in the K drive into their prospective run folders.

[ ] Notify the person currently updating social media photography to upload pictures and videos.

[ ] Upon the completion of this user story, create a new copy of the original user story 12XX – Flight Test Media Coverage for the next flight test.

**Notes**

* Only photograph and video tape with high quality equipment, your phone does not count.
* Utilize the tripod for stability and try to make sure the lens does not get droplets on it.
* **This is the original UserStory [Read-Only], please make a copy of this for every flight test. Delete this note in the new copy.**

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## 1213 – AFSL Website (Research) – JCATI 2015

**Content**

As a marketing agent, I would like to update the AFSL website “Research” section with the JCATI 2016 project so I can publicize our activities.

**Definition of Done**

[ ] Coordinate with Karine before starting this user story.

[ ] Write a project description for JCATI 2016.

[ ] Submit a photo of the project (include humanoid).

[ ] Submit a photo of the project (exclude humanoid).

[ ] Review all materials with Karine and/or Hannah.

[ ] Ensure that changes are made and correct on the final website.

**Notes**

* All website material is located in \\AFSL\WebsiteInfo
* The IEEE paper which outlines all of the work from the JCATI project is located in [\\JCATI2013\TechnicalDataPackage\IEEE Paper\CompiledVersions\MAIN\_collision\_awareness\_plugin.pdf](file:///\\JCATI2013\TechnicalDataPackage\IEEE%20Paper\CompiledVersions\MAIN_collision_awareness_plugin.pdf)

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## 1214 – Social Media Updates (copy) – AUT ‘16

**Content**

Copy of user story 1082 – Social Media Updates

As a lab member, I would like to update the activities of the lab for publicity on the AFSL website, Facebook, and YouTube pages.

**Definition of Done**

[x] Consult with Chris Lum on the activity’s description and prospective posting photos/videos.

[x] Frequently post profiles of lab members and their specific involvement in the lab on Facebook.

For every post-flight test:

[x] Upload selected videos from the flight test onto YouTube.

[x] Update the video description (follow the template on YouTube)

[x] Make sure each video tag includes: university of washington autonomous flight systems laboratory uw afsl test (schoolyear e.g. 20162017) (date e.g. 20161119) (location e.g. meadowbrooke farm) (UAS e.g. tedd) run (run# e.g. 001) (title)

[x] everything is in lowercase

[x] every word has a space in between

[x] exclude all the parenthesis

[x] Make sure the uploaded videos are included in their perspective playlists (it is possible for each video to be in more than one playlist)

[x] Share the videos uploaded onto YouTube on Facebook.

[x] Upload selected photos from the flight test onto Facebook.

[x] Confirm that the photos and videos from each flight test are uploaded onto K drive.

Flight Test:

[x] 20161129 @ Meadowbrooke Farm

[x] 20161210 @ Meadowbrooke Farm

[x] 20161216 @ Meadowbrooke Farm

[x] 20161217 @ Meadowbrooke Farm

[x] At the end of the quarter, please make a new copy user story 1082 – Social Media Updates for the next quarter.

**Notes**

* This is a quarter long commitment, please only pick it up if you can make the time.
* Every flight test for the quarter is to be included under Flight Test.
* Every video and photo needs to be in its best quality, meaning the videos are to be trimmed, and photos to be cropped if deemed necessary.
* Uploaded videos are automatically distributed into its perspective playlists if tagged correctly.
* Uploaded videos will automatically be shared through Twitter.
* Q&A about video tag: “school year (e.g. 20162017)” is considered from first day of summer courses of that year to the day before the first day of summer courses for the following year.

## 1215 – Social Media Updates (copy) – WIN ‘17

**Content**

Copy of user story 1082 – Social Media Updates

As a lab member, I would like to update the activities of the lab for publicity on the AFSL website, Facebook, and YouTube pages.

**Definition of Done**

[x] Consult with Chris Lum on the activity’s description and prospective posting photos/videos.

[x] Frequently post profiles of lab members and their specific involvement in the lab on Facebook.

For every post-flight test:

[x] Upload selected videos from the flight test onto YouTube.

[x] Update the video description (follow the template on YouTube)

[x] Make sure each video tag includes: university of washington autonomous flight systems laboratory uw afsl test (schoolyear e.g. 20162017) (date e.g. 20161119) (location e.g. meadowbrooke farm) (UAS e.g. tedd) run (run# e.g. 001) (title)

[x] everything is in lowercase

[x] every word has a space in between

[x] exclude all the parenthesis

[x] Make sure the uploaded videos are included in their perspective playlists (it is possible for each video to be in more than one playlist)

[x] Share the videos uploaded onto YouTube on Facebook.

[x] Upload selected photos from the flight test onto Facebook.

[x] Confirm that the photos and videos from each flight test are uploaded onto K drive.

Flight Test:

[x] 20170121 @ Meadowbrooke Farm

[x] 20170126 @ JCATI

[x] 20170316 @ Sixty Acres

[x] Include every additional Flight Test from this quarter here…

[x] At the end of the quarter, please make a new copy user story 1082 – Social Media Updates for the next quarter.

**Notes**

* This is a quarter long commitment, please only pick it up if you can make the time.
* Every flight test for the quarter is to be included under Flight Test.
* Every video and photo needs to be in its best quality, meaning the videos are to be trimmed, and photos to be cropped if deemed necessary.
* Uploaded videos are automatically distributed into its perspective playlists if tagged correctly.
* Uploaded videos will automatically be shared through Twitter.
* Q&A about video tag: “school year (e.g. 20162017)” is considered from first day of summer courses of that year to the day before the first day of summer courses for the following year.

## 1216 – Falco Aircraft Manual (part 2)

**Content**

As a lab member, I would like write and publish an aircraft manual for Falco

**Definition of Done**

[ ] Finish Falco’s flight manual by

* determining relevant sections
* filling in flight performance data

[ ] There should be no highlighted or unfinished sections

**Notes**

* The manual is in \FlightOperations\UAS\Falco\FalcoAircraftFlightManual.docx

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## 1217 – White Paper

**Content**

As a researcher, I would like to develop a white paper in order to get funding for future research.

**Definition of Done**

[] Use the example white paper to create a draft for the \_\_\_\_\_ project

[] Submit draft to Dr. Lum and revise as necessary

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## 1218 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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## 1219 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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## 1220 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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## 1221 – SAM Post-Mortem Analysis

**Content**

As a researcher, I would like analyze SAM’s death to conclude the cause and how to avoid it in the future.

**Definition of Done**

[ ] Run the data through the matlab code

[ ] Determine probable cause of failure

[ ] Present findings to everyone

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## 1222 – MFOC Maintenance Post 12/16 flight tests

**Content**

As a lab member, I would like to address the MFOC maintenance items that resulted from the 12/16/16 and 12/17/16 flight tests at Meadowbrook.

**Definition of Done**

[ ] Complete “Winter Items” to-do list \FlightOperations\UAS\MFOC\ConstructionAndMaintenenceLog.docx

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## 1223 – Troubleshoot CERES (Part 1)

**Content**

As a lab member, I would like to troubleshoot the high servo latency and make CERES airworthy again.

**Definition of Done**

[ x] Troubleshoot why CERES’ servos are not responsive

[x ] Fix the problem

[ ] Make sure CERES is airworthy again

**Notes:**

From 12/17/16 mission notes:

Ceres not airworthy. Need to troubleshoot the high latency between the receiver and the AC. It is not responding to the commands smoothly or immediately. GCS received “NO RC Receiver” warning intermittently during the preflight checks

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## 1224 – Troubleshoot TEDD

**Content**

As a lab member, I would like to troubleshoot the TEDD battery issue.

**Definition of Done**

[ ] Determine what TEDD’s periodic “beep beep beep” (ascending musical tone) means. It does this after boot up on the ground.

[ ] Review flight log of a successful TEDD flight for the voltage over time

[ ] Compare to a flight on 12/16 or 12/17

[ ] Troubleshoot why this battery issue might be occurring (voltage drops that cause the battery failsafe to trigger shortly after takeoff)

[ ] If problem is not resolved, ensure that TEDD’s AFM specifies that only 4 cell batteries can be used

**Notes:**

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## 1225 – Falco Rebuild

**Content**

As a lab member, I would like to rebuild Falco.

**Definition of Done**

[ ] Analyze the damage and whether it is possible\economical to rebuild Falco

[ ] If not, determine which onboard equipment is reusable

[ ] Determine if it is worth buying a new airframe to continue this line of research

If so, complete the necessary repairs

[ ] Troubleshoot and come up with a plan of how to have a successful next flight

**Notes:**

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## 1226 – SAM Rebuild

**Content**

As a lab member, I would like to rebuild SAM.

**Definition of Done**

[x] Analyze the damage and whether it is possible/economical to rebuild SAM

[x] If not, determine which onboard equipment is reusable

[x] Determine if it is worth buying a new airframe to continue this line of research

If so, complete the necessary repairs

[x] Troubleshoot and come up with a plan of how to have a successful next flight

**Notes:**

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## 1227 – MicaSense RedEdge Documentation

**Content**

As a lab member, I would like to update the documentation the lab has on the MicaSense RedEdge camera.

**Definition of Done**

[ ] Obtain new version of MicaSense RedEdge user manual

[ ] Finish the MicaSense RedEdge checklist document

**Notes:**

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**1228 – AIAA SciTech Conference Paper Draft Writing (copy)**

**Content**

As a student, I would like to summarize my research in a conference paper submission while working on relevant sections of my thesis so I can graduate

**Definition of Done**

[ ] Write relevant sections of thesis to be added to conference paper

[ ] Ensure mathematical modeling for estimators is sound within flight tracking context

**Notes**

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**1229 – AIAA SciTech Conference Paper Draft Writing (copy)**

**Content**

As a student, I would like to summarize my research in a conference paper submission while working on relevant sections of my thesis so I can graduate

**Definition of Done**

[ ] Write relevant sections of thesis to be added to conference paper

[ ] Ensure mathematical modeling for estimators is sound within flight tracking context

**Notes**

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**1230 - MAPSS Initial Gimbal System Trade Study**

**Content**

As a MAPSS Member, I would like to create a Trade Study on the difference of buying a 2 Axis Camera Gimbal system versus a 3 Axis Camera Gimbal system.

**Definition of Done**

[ ] Research the difference between 2 axis and 3 axis

[ ] Save Documentation on Perforce

[ ] Present Options to team

**Notes:**

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**1231 - MAPSS Project Plan Deliverables**

**Content**

As a MAPSS Member, I would like to complete a portion of the Project Plan Deliverables.

**Definition of Done**

[ ] Complete assigned sections of the Project Plan

[ ] Review and Edit sections with team

[ ] Finalize sections with Team in OverLeaf

[ ] Upload .tex file to Perforce

[ ] Review with Lum before sending out to MicaSense

**Notes:**

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**1232 - MAPSS Project Plan Deliverables (copy)**

**See 1231 – MAPSS Project Plan Deliverables**

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**1233 - MAPSS Project Plan Deliverables (copy)**

**See 1231 – MAPSS Project Plan Deliverables**

**1234 - MAPSS Project Plan Deliverables (copy)**

**See 1231 – MAPSS Project Plan Deliverables**

**1235 - MAPSS AERB Equipment List**

**Content**

Compile a list of equipment need for the new workspace in AERB 120

**Definition of Done**

[ ] Come up with a rough list of necessary equipment for the project

[ ] Determine how to get these items: whether they will be readily available through the department or need to be acquired some other way

[ ] Send list to Fiona Spencer

**Notes:**

fspencer@aa.washington.edu

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**1236 - MAPSS Initial Red Edge Data Acquisition**

**Content**

As a MAPSS member I would like to gain experience in gathering and analyzing the data from a Red Edge camera test.

**Definition of Done**

[ ] Download data from the Atlas Datahub website

[ ] Understand flight test process

[ ] Summarize data and report back

**Notes:**

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**1237 - MAPSS Accessory Sensor Specs and CAD work**

**Content**

As a MAPSS member, I would like to gather important specification data about the Matrice 100 Drone and the Accessory Sensor

**Definition of Done**

[ ] Research and find data on these components

[ ] Upload to Perforce (or K-Drive depending on size)

**Notes:**

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**1238 - MAPSS Accessory Sensor Dummy Model**

**Content**

As a MAPSS member, I would like to create a dummy model of the accessory sensor.

**Definition of Done**

[ ] Using specifications of the imaging component, create a Solidworks model

[ ] Contact accessory model manufacturer to get CAD file

[ ] Upload to Perforce (or K-Drive depending on size)

[ ] Create a physical dummy model of the imaging component for use during testing

**Notes:**

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**1239 - MAPSS Matrice 100 Integration**

**Content**

As a MAPSS member, I would like to create a dummy model of the Matrice main body and gimbal integration surface for integration with the Gimbal system and center of gravity estimations

**Definition of Done**

[ ] Using specs on the Matrice, create a basic Solidworks model

[ ] Upload to Perforce (or K-Drive depending on size)

[ ] Create a physical dummy model of the platform of the Matrice Base

**Notes:**

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**1240 - MAPSS Sprint 1701 Administration**

**Content**

As the MAPSS Administrator, I will manage team meetings, team schedules, and communication practices for the 1701 Sprint

**Definition of Done**

[ ] Continuous and clear flow of communications internally and externally

[ ] Engaging weekly meetings (internally and externally)

[ ] Scheduling meetings and timeline

**Notes:**

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**1241 - MAPSS Sprint 1701Budgeting**

**Content**

As the MAPSS Budgeting lead, I will manage the team budget for the 1701 Sprint and create predicitions for future sprints

**Definition of Done**

[ ] Updating budget sheet (Receipts / Travel / Consultation Fees)

[ ] Engaging weekly meetings (internally and externally)

[ ] Budgeting funds for future expenses

[ ] Continuous and clear flow of communications internally (and sometimes externally)

[ ] Research controller boards to be purchased

[ ] Research some basic skeleton gimbals for purchase

[ ] Research some motors to be used on the gimbal

[ ] Report back to team and purchase items

**Notes:**

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**1242 - MAPSS Pixhawk/MissionPlanner Integration**

**Content**

As a MAPSS member, I would like to research how to integrate a Pixhawk/Mission Planner with a gimbal system.

**Definition of Done**

[ ] Research Pixhawk/Mission Planner guide in notes and other sources

[ ] Create a guide on how to integrate a gimbal system (procedures and recommended servos)

**Notes:**

http://ardupilot.org/copter/docs/common-camera-gimbal.html

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**1243 - MAPSS 2 Axis Camera Gimbal Trade Study**

**Content**

As a MAPSS member, I would like to create a trade study for finding a suitable 2 Axis camera gimbal system.

**Definition of Done**

[ ] Research 4-7 camera gimbals

[ ] Create a Trade study based on the top 3 choices

[ ] Upload Documentation to Perforce

[ ] Report back to team

**Notes:**

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**1244 - MAPSS 2 Axis Camera Gimbal Trade Study**

**See 1243 - MAPSS 2 Axis Camera Gimbal Trade Study**

## 1245 – AFSL Website Updates (People Section) (copy)

**Content**

Copy of user story 495 – AFSL Website Updates (People Section)

As a marketing agent, I would like to update the AFSL website “People” section with new information so I can publicize our activities.

**Definition of Done**

[x] Coordinate with Chris Lum before starting this user story.

[x] Update the “People” section

[x] Remove all inactive members to past researchers section

[x] Determine where old members are now and update/highlight success stories

[x] Review all materials with Chris Lum

[x] Send mock ups to Kevin Ward.

[x] Ensure that changes are made and correct on the final website.

[x] When the user story is coming to 100% completion, please make a new copy user story 495 – AFSL Website Updates (People Section) for the next quarter/year.

**Notes**

* All website material is located in [\\AFSL\WebsiteInfo](file:///\\AFSL\WebsiteInfo)
* Coordinate with development champion for user story ‘**Error! Reference source not found.**’ (the parent user story for this current story) only if this is part of a large update.
* **This is the original UserStory [Read-Only], please make a copy of this for every quarter or year it is to be updated instead. Delete this note in the new copy.**

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**1246 – MARV JCATI Flight Test**

**Content**

As a lab member, I would like to prep and flight test MARV using the JCATI flight path.

**Definition of Done**

[ x] Ensure MARV airworthiness

[ x] Ensure JCATI flight path is ready to go

[ x] Fly the flight path several times in preparation for a flight with Argo

**Notes:**

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**1247 – Plan a Snow Excursion**

**Content**

As a flight tester, I would like to plan a flight test in a snowy location so we can try using photogrammetry techniques over snow.

**Definition of Done**

[ ] Find a location to flight test in the snow

[ ] Run a rough feasibility analysis (cost, time, etc)

[ ] Get necessary permissions (land owner, etc)

[ ] Determine necessary equipment we will need to bring

[ ] Plan test

[ ] Execute test

**Notes:**

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**1248 – SciTech Paper**

**Content**

As a lab member, I would like to work on the SciTech Paper

**Definition of Done**

[ ] TBD

**Notes:**

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**1249 – Amazon Catalyst Proposal**

**Content**

As a lab member, I would like to create a funding proposal for Amazon Catalyst.

**Definition of Done**

[ ] TBD

**Notes:**

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**1250 – JCATI Proposal**

**Content**

As a lab member, I would like to create a funding proposal for JCATI.

**Definition of Done**

[ ] TBD

**Notes:**

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**1251 – Flight Ops Administration (1701)**

**Content**

As flight operations director, I would like to complete the following tasks to administrate flight operations.

**Definition of Done**

[ ] Coordinate and administrate flight tests

**Notes**

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**1252 – Turnigy Talon Tricopter (T3) Build (copy)**

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story 1184 – Turnigy Talon Tricopter (T3) Build (copy)

**Notes**

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## 1253 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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**1254 – Purchase New Skywalker 1900**

**Content**

As a lab member, I would like to research and purchase a new Skywalker 1900 to use for parts.

**Definition of Done**

[ ] Find Skywalker 1900 online

[ ] Order through Dr. Lum or Hannah

**Notes**

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## 1255 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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## 1256 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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## 1257 – Create a TRAPIS Promo Video (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes:**

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## 1258 – Weather Station & Equipment Functionality

**Content**

As a lab member, I would like to research and purchase a weather station for the lab. I would also like to determine the functionality and best uses of it and some of the other lab equipment.

**Definition of Done**

[ ] Find a simple weather station for the lab to purchase.

* Allows basic measurements of temperature and barometric pressure
* Portable and small so we can bring it out to our flight tests

[ ] Become familiar with the use of the weather station

[ ] Become familiar with the use of our anemometer

[ ] Become familiar with the use of our RF spectrum analyzer

[ ] Determine how we can most easily and effectively integrate everything into our operations

* Write up some sort of AFSL operating manual so that anyone can figure this equipment out

**Notes:**

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## 1259 – MFOC Maintenance Post 12/16 flight tests

**Content**

Copy of user story 1222 – MFOC Maintenance Post 12/16 flight tests

**Definition of Done**

Copy of definition of done of user story 1222 – MFOC Maintenance Post 12/16 flight tests

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## 1260 – Falco Rebuild

**Content**

Copy of user story 1225 – Falco Rebuild

**Definition of Done**

Copy of definition of done of user story 1225 – Falco Rebuild

**Notes:**

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## 1261 – Camera Cases

**Content**

As a lab member, I would like to purchase protective cases for the lab’s DSLR and camcorder cameras.

**Definition of Done**

[x] Research cases that will fit the Canon EOS Rebel T5 and Canon Vixia HF R400

[x] Order the best cases based on price, durability, protection, and versatility

**Notes:**

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## 1262 – Undergrad Research Symposium

**Content**

As a researcher, I would like to present my project at the UW Undergrad Research Symposium.

**Definition of Done**

[ ] Talk to Dr. Lum for details on the symposium

[ ] Create a poster outlining your research

[ ] Present in Mary Gates Hall on Friday, May 19th, 2017

**Notes:**

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## 1263 – Flight Training Program – Multi-Rotor

**Content**

As a future sUAS pilot, I would like to complete the AFSL required training to become eligible to fly the lab’s multi-rotor aircraft.

**\*\*Flight training must be taken seriously. At some point you could be asked to safely takeoff, fly and land a $10,000 sensor in less than ideal weather, so you need to be ready to meet this challenge whenever it arises\*\***

**Definition of Done**

[x] Before anything else, read the training information located here: **\FlightOperations\Operators\Training\MultiRotorFlightTrainingInformation.docx**

[ ] Discuss reading with Hannah Rotta before moving on.

[ ] Log at least three hours of productive simulator time on PhoenixRC on the computer nearest the door. Please use a multi-rotor model. Additional time may be spent on other airframes, but a minimum three hours on a multi-rotor are required. This includes the following:

[ ] Log at least three hours here in the gray section of this document: **\FlightOperations\Operators\Training\FlightTrainingRecords.xlsx**

[ ] Practice takeoffs

[ ] Practice hovering/loitering and other basic maneuvers

[ ] Practice reverse orientation flying

[ ] Perform 15 safe landings on a Dead Calm day (weather can be adjusted in the settings)

[ ] Perform 15 safe landings on a Brisk day

[ ] Perform 15 safe landings on a Fair Wind day

[ ] Demonstrate to a lead pilot proficiency on takeoff, cruise, reverse orientation and landing

[ ] Fly MARV with buddy box system in the field and complete or show proficiency in the following:

[ ] Three successful takeoffs (in whatever mode is deemed best for training by instructor pilot)

[ ] Reverse orientation

[ ] Flight in manual mode

[ ] Flight in loiter mode

[ ] Flight in any other common modes

[ ] Proficiency in switching into and out of auto mode

[ ] Three successful landings (in whatever mode is deemed best for training by instructor pilot)

[ ] Log all time here in the blue section of this document: **\FlightOperations\Operators\Training\FlightTrainingRecords.xlsx**

[ ] Receive sign-off for multi-rotor solo flight

**Notes**

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## 1264 – MAPSS Analyze Previous Flight Data

**Content**

As a MAPSS member, I would like to look at flight and camera data from previous tests to get a hold of  the process

**Definition of Done**

[ ] Contact Hanna Rotta to get access to previous tests

[ ] Understand flight test workflow and analysis

[ ] Report back to team about findings

**Notes:**

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**1265 – Research Parameter Loading Order in Checklists**

**Content**

As a researcher, I would like to research the order parameters are loaded onto the aircrafts to make sure that important parameters are not being overwritten.

**Definition of Done**

[ ] Compare the loaded parameters and parameters gathered when Mission Planner first connects to the Pixhawk

[ ] Compare parameters after connecting Mission Planner to Pixhawk with parameters gathered after current checklist procedures

[ ] Determine if important parameters are being overwritten

[ ] Determine if the pre-flight checklist needs to be altered

[ ] Determine if checklist order could have caused crashes of AFSL aircrafts

**Notes**

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**1266 – MAPSS Passive Damping Designs Research**

**Content**

As a researcher, I would like to research damping designs that can be implemented into a gimbal system

**Definition of Done**

[ ] Perform preliminary research on standard damping designs

[ ] Coordinate with AFSL members who have previous experience with damping

[ ] Document results somewhere where it is accessible to other MAPSS members

[ ] Report back to group

**Notes**

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## 1267 – MAPSS Sprint 1701 Communication Focal Duties

**Content**

As the communication focal for the MAPSS team, I will handle external communication and publication of our work.

**Definition of Done**

[ ] Document work done thorugh pictures and video

[ ] Communicate with senior capstone administrators to understand publication practices

[ ] Create publication ready images and documentation

**Notes**

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## 1268 – MAPSS Senior Capstone Grant Application

**Content**

As the grant application writer, I want to secure extra funding for our project through the senior design project grant

**Definition of Done**

[ ] Look over application process and understand guidelines

[ ] Write a draft of an essay explaining the reasoning for extra funding

[ ] Share with group and get feedback and edits

**Notes**

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**1269 – Argo Repairs**

**Content**

As a lab developer, I would like to repair Argo so that it is airworthy

**Definition of Done**

[x] Examine if the motor can be revived

[x] Order necessary replacement parts

[x] Replace broken landing gear

[x] Replace broken motor

[x] Replace broken props

[x] Ensure general airworthiness

**Notes**

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**1270 – Argo Test Flights**

**Content**

As a lab developer, I would like to test multiple flight patterns with Argo.

**Definition of Done**

[x] Take off Argo in stabilize, loiter mode, and fly manually

[x] Create flight patterns for Argo

[x] Perform autonomous flight

[x] Execute JCATI flight test patterns with Argo

**Notes**

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| * Manual flight is really difficult due to Argo’s power and touchy controls. * It would be best to stick to auto mode and let the mission planner do the flying * Avoid stabilize mode whenever possible (Shouldn’t really be a reason to use it) * If flying manually, use loiter mode |

**1271 – Piksi Ground Test and 3d printed Mount**

**Content**

As a lab developer, I would like to get familiar with the piksi GUI and ground test the system

**Definition of Done**

[x] Become familiar with simulator mode

[x] Become familiar with setting up rover and base station modes

[x] Survey the ground station position

[x] Ensure the two piksi devices are communicating over radio and have satellite locks

[x] Check for fixed rtk positioning

[x] Walk around the base station in a circle and verify the rover is receiving accurate data

**Notes**

**1272 – Piksi 3d printed Mount**

**Content**

As a lab developer, I would like to prepare a mount for flight testing the Piksi GPS

**Definition of Done**

[] Remove magnets from Piksi antennae

[x] 3d print a mount

[] Create a grounding plate for the piksi

[] Attach grounding plates to acrylic plate

[] Attach acrylic plate to 3d printed mount

**Notes**

**1273 – Archival and Data Analysis for Mission 1/21/17**

**Content**

As a researcher, I would like to archive the data gathered on the flight mission from 1/21/17.

**Definition of Done**

[ ] Ensure all Data flash logs and telemetry logs for each recorded flight are put into a file structure

[ ] Convert the logs into matlab files

[ ] Upload Raw Data and Media to KDrive with permission of Dr. Lum

[ ] Set up robocopy

[ ] Set up matlab Data Analysis file

**Notes**

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**1273 – MAPSS MicaSense Rededge CAD Work**

**Content**

As a researcher, I would like to analyze the Rededge using Solidworks.

**Definition of Done**

[ ] Gather STEP files from David at MicaSense

[ ] Analyze and edit part file for use in a gimbal set up

[ ] integrate accessory sensory into analysis

**Notes**

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## 1274 – JCATI To-Do Items (Copy)

**Content**

As a lab member, I need to prepare for the upcoming SDR flight and ground tests for the JCATI project.

**Definition of Done**

[ ] Determine the exact frequency of primary c2 transmitter

[ ] Obtain an Ethernet cable for the connection between GCS to GSN

[ ] Generate a master project vision document

[ ]Outline hardware components

[ ]Identify all wireless links: primary transmitter, 3dr radio, wifi, bladeRF, fpv, etc.

[ ]Identify nomenclature an dnames for all components and actors

[ ] Research picksi RTK

[ ] Update flight test cards

[ ] Different altititudes

[ ] Tripod on top of trailer

[ ] Update MARV AFM

[ ] Marco Polo tracker and arm/disarm procedure

[ ] Create ARGO AFM

[ ] Edit Noshad’s Document

[ ] ARGO indoor flight test

**Notes**

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**1275 – MARV JCATI Flight Test (Copy)**

**Content**

As a lab member, I would like to prep and flight test MARV using the JCATI flight path.

**Definition of Done**

[ x] Ensure MARV airworthiness

[ x] Ensure JCATI flight path is ready to go

[ x] Fly the flight path several times in preparation for a flight with Argo

**Notes:**

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**1276 – MAPSS Flight Test Analysis**

**Content**

As a researcher, I would like to understand and get practice analyzing flight test data in order to be better prepared for later flight tests.

**Definition of Done**

[ ] Understand the file structure for flight test data

[ ] Use the MATLAB script to analyze the data

[ ] Create a short presentation to show off during a weekly AFSL Meeting

**Notes**

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**1277 – MAPSS Flight Test Analysis (copy)**

**Content**

As a researcher, I would like to understand and get practice analyzing flight test data in order to be better prepared for later flight tests.

**Definition of Done**

[ ] Understand the file structure for flight test data

[ ] Use the MATLAB script to analyze the data

[ ] Create a short presentation to show off during a weekly AFSL Meeting

**Notes**

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**1278 – MAPSS Flight Test Analysis (copy)**

**Content**

As a researcher, I would like to understand and get practice analyzing flight test data in order to be better prepared for later flight tests.

**Definition of Done**

[ ] Understand the file structure for flight test data

[ ] Use the MATLAB script to analyze the data

[ ] Create a short presentation to show off during a weekly AFSL Meeting

**Notes**

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**1279 – MAPSS Flight Test Analysis (copy)**

**Content**

As a researcher, I would like to understand and get practice analyzing flight test data in order to be better prepared for later flight tests.

**Definition of Done**

[ ] Understand the file structure for flight test data

[ ] Use the MATLAB script to analyze the data

[ ] Create a short presentation to show off during a weekly AFSL Meeting

**Notes**

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**1280 – MAPSS Flight Test RedEdge Data Acquisition**

**Content**

As a researcher, I would like to run a flight test to gather a data set from the MicaSense RedEdge camera.

**Definition of Done**

[ ] Coordinate with Hannah to get a flight test done with the MicaSense Rededge without a gimbal

[ ] Perform the flight test

[ ] Analyze the data from the flight test and measure the improvement from using a gimbal after doing another test with the gimbal

**Notes**

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**1281 – MAPSS Flight Test RedEdge Data Acquisition (copy)**

**Content**

As a researcher, I would like to run a flight test to gather a data set from the MicaSense RedEdge camera.

**Definition of Done**

[ ] Coordinate with Hannah to get a flight test done with the MicaSense Rededge without a gimbal

[ ] Perform the flight test

[ ] Analyze the data from the flight test and measure the improvement from using a gimbal after doing another test with the gimbal

**Notes**

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**1282 – MAPSS Flight Test RedEdge Data Acquisition (copy)**

**Content**

As a researcher, I would like to run a flight test to gather a data set from the MicaSense RedEdge camera.

**Definition of Done**

[ ] Coordinate with Hannah to get a flight test done with the MicaSense Rededge without a gimbal

[ ] Perform the flight test

[ ] Analyze the data from the flight test and measure the improvement from using a gimbal after doing another test with the gimbal

**Notes**

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**1283 – MAPSS Flight Test RedEdge Data Acquisition (copy)**

**Content**

As a researcher, I would like to run a flight test to gather a data set from the MicaSense RedEdge camera.

**Definition of Done**

[ ] Coordinate with Hannah to get a flight test done with the MicaSense Rededge without a gimbal

[ ] Perform the flight test

[ ] Analyze the data from the flight test and measure the improvement from using a gimbal after doing another test with the gimbal

**Notes**

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**1284 – Flight Training Program (copy)**

**Content**

Copy of user story 1127 – Flight Training Program

As a future sUAS pilot, I would like to complete the AFSL required training to become eligible to fly the lab’s aircraft.

**Definition of Done**

[x] Before anything else, read the training information located here: **\FlightOperations\Operators\Training\FlightTrainingInformation.docx**

[x] Log at least three hours of productive simulator time on PhoenixRC on the computer nearest the door. Please use the **Multiplex EasyStar AFSL\_Skywalker\_Trainer** model (listed under the favorites – this is important because the version that doesn’t say AFSL\_Skywalker\_Trainer does not have ailerons). Additional time may be spent on other airframes, but a minimum three hours on the EasyStar are required. This includes the following:

[ ] Log at least three hours here in the gray section of this document: **\FlightOperations\Operators\Training\FlightTrainingRecords.xlsx**

[x] Practice flying a basic traffic pattern

[x] Practice reverse orientation flying

[x] Perform 15 safe landings on a Dead Calm day (weather can be adjusted in the settings)

[x] Perform 15 safe landings on a Brisk day

[x] Perform 15 safe landings on a Fair Wind day

[x] Demonstrate to a lead pilot proficiency on takeoff, cruise, reverse orientation and landing

[x] Fly Ben with buddy box system in the field and complete or show proficiency in the following:

[x] General flight training on 20170303

[x] Log all time here in the blue section: **\FlightOperations\Operators\Training\FlightTrainingRecords.xlsx**

[ ] Fly Anakin with buddy box system in the field and complete or show proficiency in the following:

[ ] Three successful takeoffs

[ ] Reverse orientation

[ ] Cruise in manual mode

[ ] Cruise in stabilize mode

[ ] RTL mode

[ ] Three successful landings

[ ] Log all time here in the blue section: **\FlightOperations\Operators\Training\FlightTrainingRecords.xlsx**

[ ] Receive approval for fixed wing solo flight

**Notes**

* Rotor flight will require rotor specific training

**1285 – Electronics Development Workstation**

**Content**

As a lab member, I would like to convert the Arduino workstation into an electronics development workstation so that the space can be available for soldering and electronics development.

**Definition of Done**

[ ] Build a shelf to hold the scopes, power supplies, etc.

[ ] Install the HP Envy laptop and monitor at the station

[ ] Install soldering irons, helping hands, etc.

[ ] Obtain necessary components (jumpers, breadboards, etc)

[ ] Clean up the work area

**Notes**

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**1286 – Flight Incidents Documentation**

**Content**

As a lab member, I would like to develop a centralized location to store all of the information about our flight incidents.

**Definition of Done**

[ ] Compile information about our airplane crashes

[ ] Analyze data about flight crashes

[ ] Write up this info including possible causes, ways to mitigate these crashes in the future, etc in a report format

**Notes**

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**1287 – Anakin Post-Mortem Analysis**

**Content**

As a lab member, I would like to determine the cause of Anakin’s untimely death.

**Definition of Done**

[ ] Analyze video footage and documented reports about the crash

[ ] Analyze Matlab data

[ ] Analyze data available on Mission Planner, using tlogs and data flash logs

[ ] Determine the most likely cause and present it to the group at a weekly meeting

[ ] Figure out the failsafe parameters that apply to this sort of situation (loss of RC receiver) and if these need changing in order to prevent this in the future. Ex. FS\_LONG\_ACTN and FS\_SHORT\_ACTN

[ ] If so, make this change across all of the fixed wing aircraft (if necessary, conduct a flight test to ensure this won’t cause anything else to malfunction)

**Notes**

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## 1288 – Anakin Rebuild

**Content**

As a lab member, I would like to rebuild Anakin.

**Definition of Done**

[ ] Analyze the damage and whether it is possible/economical to rebuild Anakin

[ ] If not, determine which onboard equipment is reusable

[ ] Determine if it is worth buying a new airframe to continue this line of research

If so, complete the necessary repairs

[ ] Troubleshoot and come up with a plan of how to have a successful next flight

[ ] Record all changes on Anakin’s construction and modification log

**Notes:**

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## 1289 – SAM Rebuild (copy)

**Content**

Copy of user story 1226 – SAM Rebuild

**Definition of Done**

Copy definition of done from user story 1226 – SAM Rebuild

**Notes**

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## 1290 – Anakin Rebuild (copy)

**Content**

Copy of user story 1288 – Anakin Rebuild

**Definition of Done**

Copy definition of done from user story 1288 – Anakin Rebuild

**Notes**

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**1291 – MAPSS Poster Session 2/4**

**Content**

As a researcher within the MAPSS Team, I would like to prepare for and present at the poster session on February 4th.

**Definition of Done**

[ ] Work with the three other MAPSS members to design a publication worthy poster

[ ] Coordinate quickly with David to make sure everything on the poster is allowed to be shared

[ ] Attend and contribute to the presentation at the poster session on Friday 2/4

**Notes**

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**1292 – MAPSS Poster Session 2/4 (copy)**

**Content**

As a researcher within the MAPSS Team, I would like to prepare for and present at the poster session on February 4th.

**Definition of Done**

[ ] Work with the three other MAPSS members to design a publication worthy poster

[ ] Coordinate quickly with David to make sure everything on the poster is allowed to be shared

[ ] Attend and contribute to the presentation at the poster session on Friday 2/4

**Notes**

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**1293 – MAPSS Poster Session 2/4 (copy)**

**Content**

As a researcher within the MAPSS Team, I would like to prepare for and present at the poster session on February 4th.

**Definition of Done**

[ ] Work with the three other MAPSS members to design a publication worthy poster

[ ] Coordinate quickly with David to make sure everything on the poster is allowed to be shared

[ ] Attend and contribute to the presentation at the poster session on Friday 2/4

**Notes**

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**1294 – MAPSS Poster Session 2/4 (copy)**

**Content**

As a researcher within the MAPSS Team, I would like to prepare for and present at the poster session on February 4th.

**Definition of Done**

[ ] Work with the three other MAPSS members to design a publication worthy poster

[ ] Coordinate quickly with David to make sure everything on the poster is allowed to be shared

[ ] Attend and contribute to the presentation at the poster session on Friday 2/4

**Notes**

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**1295 – MAPSS Multiwii Gimbal Integration**

**Content**

As a researcher within the MAPSS Team, I would like to integrate the Multiwii microcontroller into the gimbal system.

**Definition of Done**

[ ] Analyze and understand controller introduction within gimbal systems

[ ] work with the other MAPSS members to tinker with the hardware and software to integrate the new controller

[ ] successfully integrate the Multiwii

[ ] Document Results

**Notes**

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**1296 – MAPSS Multiwii Gimbal Integration (copy)**

**Content**

As a researcher within the MAPSS Team, I would like to integrate the Multiwii microcontroller into the gimbal system.

**Definition of Done**

[ ] Analyze and understand controller introduction within gimbal systems

[ ] work with the other MAPSS members to tinker with the hardware and software to integrate the new controller

[ ] successfully integrate the Multiwii

[ ] Document Results

**Notes**

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**1297 – MAPSS Multiwii Gimbal Integration (copy)**

**Content**

As a researcher within the MAPSS Team, I would like to integrate the Multiwii microcontroller into the gimbal system.

**Definition of Done**

[ ] Analyze and understand controller introduction within gimbal systems

[ ] work with the other MAPSS members to tinker with the hardware and software to integrate the new controller

[ ] successfully integrate the Multiwii

[ ] Document Results

**Notes**

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**1298 – MAPSS Multiwii Gimbal Integration (copy)**

**Content**

As a researcher within the MAPSS Team, I would like to integrate the Multiwii microcontroller into the gimbal system.

**Definition of Done**

[ ] Analyze and understand controller introduction within gimbal systems

[ ] work with the other MAPSS members to tinker with the hardware and software to integrate the new controller

[ ] successfully integrate the Multiwii

[ ] Document Results

**Notes**

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## 1299 – Student Technology Fee Proposal (copy) – LIDAR

**Content**

Copy of user story 479 – Student Technology Fee Proposal

As a project manager, I would like to submit a proposal to the UW Student Technology Fee to see if we can obtain funding for some of our purchases.

**Definition of Done**

[x] Coordinate with Chris Lum before starting this story.

[x] Read about the STF proposal process at <https://techfee.washington.edu/>

[x] Read past successful proposals in related areas. Two from David Shean are

[x] <https://techfee.washington.edu/proposals/2013-079/>

[x] <https://techfee.washington.edu/proposals/2014-059/>

[x] Coordinate with Eleanor Forbes and get her advice on successful proposals to the STF.

[x] Add additional tasks to this user story as appropriate (for example obtaining relevant student testimonials and department support)

[x] Ensure that deadline for the proposal is being tracked by Chris Lum

[x] Create a list of equipment to ask for and create an appropriate budget.

[x] Obtain signatures

[x] Author

[x] Main Contact

[x] Budget Contact

[x] Dean Contact

[x] Create proposal and get this reviewed with Hannah and Chris.

[x] Submit the proposal.

**Definition of Done**

Copy definition of done from user story 479 – Student Technology Fee Proposal

## 1300 – Apprehend the usage of Image Acquisition Toolbox

**Content**

As a developer in image processing, I would like to learn technique that allows image processing on live footage using Matlab Image Acquisition Toolbox.

**Definition of Done**

[x] Check document online to learn about its usage

[x] Try and apply Image Acquisition Toolbox to the object following algorithm

[x] Do a successful test

[] upload successful demo onto Perforce

## 1301 – Unit test for integrated visual anchoring algorithm

**Content**

As a developer working on visual anchoring projects, I would like to conduct unit tests on how the image processing algorithm integrates with the slant range algorithm.

**Definition of Done**

[] Integrate object tracking code with the slant range algorithm

[] Write unit tests on each junction of the integrated code

[] Try integrate in the MAIN\_Algorithm code

[] Write further unit tests on newly integrated code

[] Pass all tests

[] Upload bug-free algorithm and test documents to the Perforce

## 1302 – Clean up unused visual anchoring code

**Content**

As a developer working on visual anchoring project, I’d like to organize the work space and clean out code that are not used in the algorithm.

**Definition of Done**

[] Decide which folders in Visual Anchoring Folder contains unused/untrustworthy code

[] Remove the code from Perforce

## 1303 – Recruit more people for visual anchoring project

**Content**

As a developer working on visual anchoring project, I’d like to recruit more people to join the project so that progress can be made at a higher efficiency.

**Definition of Done**

[] Send out email through AFSL mailing list about needing more people for visual anchoring

[] Assign tasks to specific people

[] Get new people in:

[] Matlab coding

[] Video transmission

[] Plane setup

## 1304 – Ground test 1 for visual anchoring

**Content**

As a developer working on visual anchoring project, I’d like to conduct a ground test to test the accuracy of the tracking algorithm and the slant range algorithm

**Definition of Done**

[] Conduct the test on a open space

[] Stick the plane on top of the stick and have a person walk around target while holding the rod

[] Should test with the camera that’s meant to be used in actual flight test

[] Should have the ground station set up to receive transmitted data on euler angles and slant range

## 1305 – Develop and Document Slant Range Algorithm

**Content**

As a developer working on visual anchoring project, I’d like to develop a slant range algorithm to be used within the CONDOR vision system.

**Definition of Done**

[] Create Matlab code that processes tracking and mission planner inputs and outputs slant range

[] Document code within Matlab and create powerpoint presentation describing conceptual ideas of algorithm

## 1306 – Configure and Install Camera Gimbal and Video Transmitter

**Content**

As a developer working on visual anchoring project, I’d like to configure and install the camera gimbal and video transmitter on the CONDOR aircraft.

**Definition of Done**

[] Install the camera gimbal and video transmitter on CONDOR (ensure correct connections)

[] Configure camera gimbal servo controls using transmitter G and configure Mobius Action camera to transmit video to video receiver and capture card

[] Conduct test to make sure capture card can receive live footage from the Mobius Action camera

## 1307 – Unit Test Slant Range Algorithm

**Content**

As a developer working on visual anchoring project, I’d like to unit test the developed slant range algorithm.

**Definition of Done**

[] Create sufficient test cases and expected slant ranges for each test case to be used to test the code

[] Ensure slant range code works for each test case

## 1308 – Clean up unused visual anchoring code (copy)

**Content**

As a developer working on visual anchoring project, I’d like to organize the work space and clean out code that are not used in the algorithm.

**Definition of Done**

[] Decide which folders in Visual Anchoring Folder contains unused/untrustworthy code

[] Remove the code from Perforce

## 1309 – Investigating RC Inputs and Outputs

**Content**

As a researcher, I would like to investigate the remote controlled inputs and outputs and the spikes that are processed in Matlab and Mission Planner.

**Definition of Done**

[ ] Compare Anakin's Flight046 to previous Anakin flights in Matlab

[ ] Investigating how the data flash and telemetry logs record the inputs and outputs and look for any "spikes" in RC output that was not inputted by the PIC

[ ] Investigate how a connection drop in RC controller could affect the inputs and outputs

[ ] Research any other queries on this topic

[ ] Present findings to group

## 1310 – Student Technology Fee Proposal (copy) – LIDAR

**Content**

Copy of user story 479 – Student Technology Fee Proposal

## 1311 – Optimizing Various Mission Planner Parameters

**Content**

As a researcher, I would like to investigate some of the parameters on mission planner and determine the best settings for them.

**Definition of Done**

[ ] Research to determine what the optimum stream rate parameters are. For example, most of our planes have been using 4Hz for some of the stream rates, while MARV uses 10Hz. We should decide which stream rate is best and standardize all of the aircraft. These parameters are more specifically:

* SR1\_EXTRA1
* SR1\_EXTRA2
* SR1\_POSITION

[ ] Research the parameters associated with a lost link/lost RC receiver and determine what these parameters should be in order to ensure the airplane continues to fly safely during one of these events. i.e. we don’t want to pull an Anakin nose dive again.

[ ] Research what the COMPASS\_DEC parameter does and where it gets its value from. Also research the compass calibration process. Determine if we need to start doing the compass calibration each flight test at the location. Currently, we do the compass calibration once, usually outside of AERB which could be affected by all of the interference associated with this part of campus - close to labs and buildings, etc that conduct high energy experiments.

**Notes:**

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**1312 – Flight Training Program – Multi-Rotor (copy)**

**Content**

Copy of user story 1263 – Flight Training Program

## 1313 – Aircraft Part Familiarization

**Content**

Copy of user story 1079 – Aircraft Part Familiarization

**1314 – Part 107 Test Preparation (copy)**

**Content**

As a researcher, I would like to prepare for and take the FAA Part 107 Commercial Remote Pilot Certification test.

**Definition of Done**

[x] Take the online course offered by the FAA

[x] Take the three practice tests on the network drive

[x] Study all topics identified as weak when taking practice tests

[x] Take the part 107 test

[x] Do the paperwork to get the license from the FAA

[x] Do the paperwork to get reimbursed for test

**Notes**

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## 1315 – Anakin Crash Analysis

**Content**

As a researcher, I would like analyze Anakin’s death to conclude the cause and how to avoid it in the future.

**Definition of Done**

[ ] Analyze dataflash logs

[ ] Determine probable cause of failure

[ ] Test airplane behavior with actual hardware

[ ] Present findings to everyone

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## 1316 – Swarm Waiver

**Content**

As a researcher, I would like apply for a waiver to fly multiple UAVs at once.

**Definition of Done**

[ ] Research waiver requirements \FlightOperations\Operations\COWs\Part107Waiver\_Instructions.pdf and \FlightOperations\Operations\COWs\Part107Waiver\_PerformanceBasedStandards.pdf

[ ] Research what other people have done to get this waiver previously

[ ] Refer to AFSL’s altitude waiver for inspiration \FlightOperations\Operations\COWs\AltitudeWaiver\107W-2016-01765\_51bsigned.pdf

[ ] Ensure our aircraft can meet requirements

[ ] Write waiver

[ ] Ensure waiver is peer reviewed

[ ] Submit

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## 1317 – MAPSS PDR Session (3/10)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the PDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1318 – MAPSS PDR Session (3/10) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the PDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1319 – MAPSS PDR Session (3/10) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the PDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1320 – MAPSS PDR Session (3/10) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the PDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1321 – MAPSS CDR Session (4/28)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the CDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1322 – MAPSS CDR Session (4/28) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the CDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1323 – MAPSS CDR Session (4/28) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the CDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1324 – MAPSS CDR Session (4/28) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the CDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1325 – MAPSS FDR Session (6/5)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the FDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1326 – MAPSS FDR Session (6/5) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the FDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1327 – MAPSS FDR Session (6/5) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the FDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1328 – MAPSS FDR Session (6/5) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and contribute to presenting at the FDR session.

**Definition of Done**

[ ] Compile previous work done

[ ] Collaborate with other team members to creat a presentable product for display

[ ] Participate at the actual event and speak

[ ] Coordinate with other team members to improve for further presentations

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## 1329 – MAPSS Meeting Attendance Sprint 1702

**Content**

As a MAPSS Team member, I would like to take part in and be present at all meetings

**Definition of Done**

[ ] Compile previous work done

[ ] Arrive at meetings on time and ready to participate Monday, Tuesday and biweekly Thursday

[ ] Compile personal notes and info to access and refer to later

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## 1330 – MAPSS Meeting Attendance Sprint 1702

**Content**

As a MAPSS Team member, I would like to take part in and be present at all meetings

**Definition of Done**

[ ] Compile previous work done

[ ] Arrive at meetings on time and ready to participate Monday, Tuesday and biweekly Thursday

[ ] Compile personal notes and info to access and refer to later

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## 1331 – MAPSS Meeting Attendance Sprint 1702

**Content**

As a MAPSS Team member, I would like to take part in and be present at all meetings

**Definition of Done**

[ ] Compile previous work done

[ ] Arrive at meetings on time and ready to participate Monday, Tuesday and biweekly Thursday

[ ] Compile personal notes and info to access and refer to later

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## 1332 – MAPSS Meeting Attendance Sprint 1702

**Content**

As a MAPSS Team member, I would like to take part in and be present at all meetings

**Definition of Done**

[ ] Compile previous work done

[ ] Arrive at meetings on time and ready to participate Monday, Tuesday and biweekly Thursday

[ ] Compile personal notes and info to access and refer to later

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## 1333 – MAPSS Gimbal Flight Test- Prototype 1 (3/4)

**Content**

As a MAPSS Team member, I would like to take part in and perform the flight test on 3/4

**Definition of Done**

[ ] Coordinate with Connor and Zach to combine flight tests

[ ] Get prototype 1 to be attachable to ARGO and verify fidelity

[ ] Travel to Flight test location and oversee your duty during the test

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## 1334 – MAPSS Gimbal Flight Test- Prototype 1 (3/4) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and perform the flight test on 3/4

**Definition of Done**

[ ] Coordinate with Connor and Zach to combine flight tests

[ ] Get prototype 1 to be attachable to ARGO and verify fidelity

[ ] Travel to Flight test location and oversee your duty during the test

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## 1335 – MAPSS Gimbal Flight Test- Prototype 1 (3/4) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and perform the flight test on 3/4

**Definition of Done**

[ ] Coordinate with Connor and Zach to combine flight tests

[ ] Get prototype 1 to be attachable to ARGO and verify fidelity

[ ] Travel to Flight test location and oversee your duty during the test

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## 1336 – MAPSS Gimbal Flight Test- Prototype 1 (3/4) (copy)

**Content**

As a MAPSS Team member, I would like to take part in and perform the flight test on 3/4

**Definition of Done**

[ ] Coordinate with Connor and Zach to combine flight tests

[ ] Get prototype 1 to be attachable to ARGO and verify fidelity

[ ] Travel to Flight test location and oversee your duty during the test

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## 1337 - MAPSS Gimbal-less Rededge Flight Test

**Content**

As a MAPSS Team member, I would like to take part in and perform the flight test in March with the MicaSense Rededge without a gimbal.

**Definition of Done**

[ ] Coordinate with Hannah to work out a flight test card

[ ] Get prototype 1 to be attachable to a quadcopter and verify fidelity

[ ] Attach MicaSense Rededge

[ ] Travel to Flight test location and oversee your duty during the test

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## 1338 - MAPSS Accessory Sensor Testing

**Content**

As a MAPSS Team member, I would like to borrow the accessory sensor from MicaSense and perform thermal testing with vibrational testing

**Definition of Done**

[ ] Coordinate with David to get the accessory sensor

[ ] Find a secure location to store the camera

[ ] Create a test bed for the sensor

[ ] Perform tests to determine the quality of data while attached to the gimbal

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**1339 – MAPSS Vibrational Testing Setup**

**Content**

As a researcher, I would like to research damping designs using the vibrational table

**Definition of Done**

[ ] Perform preliminary research on standard damping designs

[ ] Coordinate with Aman and use shaker table for testing on gimbal

[ ] Document results and report back to the team

**Notes**

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## 1352 – VTOL/QuadPlane

**Content**

As a lab member, I would like to investigate adding VTOL functionality to an X8, or other relevant fixed wing platform.

**Definition of Done**

[ ] Investigate what other people have done (see video links below)

[ ] Investigate QuadPlane <http://ardupilot.org/plane/docs/quadplane-support.html>

[ ] Can this or something similar also apply to tricopter configuration?

[ ] Become very familiar with all the parameters involved and how it integrates with mission planner and the RC transmitter

[ ] Determine what hardware is required to integrate with our X8s

[ ] Test hardware and software functionality before integrating on an airframe (maybe see if you can make this work using a hardware in the loop or similar configuration)

[ ] Integrate with an X8

[ ] Create a test card

**Notes**

See vidoes for proof of concept

a.       <https://www.youtube.com/watch?v=HorL1iie4YQ&feature=youtu.be>

b.      <https://www.youtube.com/watch?v=eODxUsNiRgE>

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## 1353 – Engineering Discovery Days Prep

**Content**

As a lab member, I would like to prep the lab for Engineering Discovery Days: April 21st.

**Definition of Done**

[ ] Decide what exhibits we want (simulators, display aircraft, etc)

[ ] How do we want to present the exhibits?

[ ] Coordinate to move the MFOC to “the option A site” (see notes)

[ ] Solicit volunteers for the lab (see \\FlightOperations\Operations\AFSLFlightOperations\VolunteerSignups\17\_04\_21\_EngineeringDiscoveryDays.docx)

[ ] Review proposed exhibit with Chris and Hannah several weeks before event.

[ ] Assign someone to take photos for AFSL publicity during the event

[ ] Advertise for this event (create an event on Facebook). See notes for picture that can be used

[ ] Do what else it takes to prepare

**Notes**

* Coordinate with Hannah to place MFOC in parking space and run electrical.
* Some ideas of exhibits
  + Fly the Phantom 3 Pro inside a tent next to the MFOC
  + Flight simulators both inside and outside the MFOC
  + Live FPV video from aircraft to MFOC
  + Drive GROVER around
  + Posters
* Pictures from 2016 are located at "K:\AFSL\PicturesAndMedia\16\_04\_22\_discovery\_days"
* See <http://www.engr.washington.edu/future/k12/discoverydays> for more info

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## 1354 – Perforce Visual Client (copy)

**Content**

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**Definition of Done**

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## 1355 – MAPSS Prototype 1 Documentation

**Content**

As a MAPSS member, I would like to document the equipment and operations guide for Prototype 1.

**Definition of Done**

[ ] Complete documentation on \MAPSS\Research\Prototypes\MAPSS Prototype 1.docx

[ ] Recommend potential improvements for future prototypes

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## 1356 – MAPSS SONY A5100 Documentation

**Content**

As a MAPSS member, I would like to document the operations guide for the Sony A5100.

**Definition of Done**

[ ] Complete documentation on \MAPSS\Research\Sony a5100\Sony a5100

[ ] Basic procedures (powering/charging, switching modes, accessing images, etc)

[ ] Equipment needed / used

[ ] Useful Settings

[ ] Remote Connection procedure

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## 1357 – Modulation Transfer Function Research & Documentation

**Content**

As a MAPSS member, I would like to research Modulation Transfer Function and document procedures to capture MTF scores and charts.

**Definition of Done**

[ ] Complete documentation on \MAPSS\Research\MTF Research\MTF initial research.docx

[ ] Document MTF score post-processing procedure

[ ] Comparison with MicaSense procedures

[ ] Share results with rest of MAPSS Team

[ ] Create short MTF score section (images/descriptions) for future capstone presentations

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## 1358 – MAPSS Test Card Creation (Part 1)

**Content**

As a MAPSS member, I would like to set up a test card plan for MAPSS flight tests.

**Definition of Done**

[ ] Complete Test Card for Prototype 1

[ ] Combine flight test card with JCATI 2016’s flight test card

[ ] Acceptance at Flight Readiness Review

[ ] Suggesting improvements for future MAPSS Flight Tests

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## 1359 – MAPSS MTF Poster Creation (Part 1)

**Content**

As a MAPSS member, I would like to create a poster for gathering MTF data

**Definition of Done**

[ ] Research appropriate sizing for poster (camera can capture the whole poster from more than 1ft)

[ ] Create poster

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Note: Part 2 is the flight test ready version (larger in scale)

## 1360 – Luke Rebuild

**Content**

As a lab member, I would like to rebuild Luke.

**Definition of Done**

[ ] Analyze the damage and whether it is possible/economical to rebuild Luke

[ ] If not, determine which onboard equipment is reusable

[ ] Determine if it is worth buying a new airframe to continue this line of research

If so, complete the necessary repairs

[ ] Complete hardware integration

[ ] Complete software integration, including parameter settings, Pixhawk calibration

[ ] Troubleshoot and come up with a plan of how to have a successful next flight (talke to Ryan Grimes about Luke post-mortem and how we can avoid the same issue in the future

[ ] Record all changes on Anakin’s construction and modification log

[ ] Make a test card for Luke’s first flight back in action

**Notes:**

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## 1361 – Perforce Visual Client (copy)

**Content**

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**Definition of Done**

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## 1362 – Perforce Visual Client (copy)

**Content**

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## 1363 – Perforce Visual Client (copy)

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**Definition of Done**

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## 1364 – Indoor Flight Testing Location

**Content**

As a lab member, I would like to investigate indoor flight testing locations for low altitude / ground testing for AFSL projects.

**Definition of Done**

[ ] Investigate nearby indoor flight testing locations

[ ] Determine suitable locations with Hannah

[ ] Email/Call Flight test location for more information

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## 1365 – Cera Build

**Content**

As a UAS operator, I would like to build the Turnigy Talon Tricopter (T3) so I can use it for demonstration purposes as well as research and testing.

**Definition of Done**

[ ] Build the Turnigy Talon Tricopter and make it airworthy. Some subsystem to consider include but are not limited to:

[ ] ESC

[ ] Battery switches

[ ] Pixhawk mini

[ ] Video Tx

[ ] Camera

[ ] Review final product with Chris Lum.

[ ] Come up with a name for the system

[ ] Document all construction in appropriate location.

[ ] Present results to research group.

[ ] Conduct flight tests.

[ ] Additional tasks TBD

**Notes**

* See build notes for MARV.

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## 1366 – Perforce Visual Client (copy)

**Content**

As a software developer, I would like a Perforce client installed on my machine and would like to be comfortable with its use so I may sync files and make code changes.

**Definition of Done**

[x] Read the document \\AFSL\HowToDocumentation\installing\_p4v.docx (contact Chris Lum to obtain this document)

[x] Follow this document’s instructions to install P4V (Perforce Visual Client). You can obtain the binary installation file from <http://faculty.washington.edu/lum/AFSL>.

[x] Attended discussion/training with CL regarding Perforce operation and concepts.

[x] Successfully create and sync relevant workspaces (both documentation and code)

[ ] Successfully check something into the depot

[ ] Practice resolving merge conflicts (artificially create a test file and work with another group member to create a conflict and resolve this). Make a note of the difference between merging a text file vs. a binary file.

[x] Read the document \\AFSL\LabInfo\NewLabMemberOrientation.docx.

[x] Create your folder in the \\UserFiles\ depot

[x] Update your information in the \\AFSL\LabInfo\ContactInfo.xlsx file.

[ ] Add a 150x200 pixel .jpg to \\AFSL\WebsiteInfo\People\.

[ ] Add a brief bio to \\AFSL\WebsiteInfo\People\People.docx.

**Notes**

* Recall that Perforce cannot create individual folders. In order to create a folder on the depot, you may need to use a dummy, placeholder file within a folder. By checking in this dummy file, Perforce will simultaneously create the desired folder.
* You can usually find help from someone in the lab (AERB 139).
* Do NOT check in large data sets or files into Perforce. Once you check something into Perforce, it takes up hard drive space even if you delete it later (remember that Perforce retains all versions of a file).
* If you need to delete a workspace, talk to Chris Lum before attempting this.
* If you have any questions, please ask a more experienced member before making changes.

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## 1370 – Gimbal Trade Study and Mounting for Visual Anchoring (1703)

**Content**

As a developer working on visual anchoring project, I’d like to configure and install the camera gimbal and video transmitter on the CONDOR aircraft (Skywalker 1900).

**Definition of Done**

[X]Research varing types of camera and gimbal setups that have minimum 2 axis control

[X]Design mounting points for 3 axis gimbal under wing and on canopy of Skywalker 1900

[X] Install the camera gimbal and video transmitter on CONDOR (under wing /ensure correct connections)

[X] Configure camera gimbal servo controls using transmitter G and configure Mobius Action camera to transmit video to video receiver and capture card

[X] Conduct test to make sure capture card can receive live footage from the Mobius Action camera

**Notes**

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**1371 – Adapter for new PC power supply for battery charging (1702)**

**Content**

Take new PC power supply provided by Professor Lum and use as power supply for charging. Adapter created to draw requires 12V from power supply to charger using 20 pin connector, as opposed to re-terminating wiring on the power supply wiring itself.

**Definition of Done**

[X] Complete adapter and provide to the lab in the Power/Charging tool box with power supply and charger.

**Notes**

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**1372 – Pixhawk mounting test for vibration dampening (1703)**

**Content**

Design and build a mounting plate for dampening the vibrations of the Pixhawk. Configure for the Skywalker 1900 airframe. Perform vibration test with and without the new mounting plate. Compare results.

**Definition of Done**

[X] Prove design concept of building and mounting pixhawk with mounting plate and dampeners and install in Skywalker 1900.

[X] Prepare for ground test to collect data and prove if design is useful.

**Notes**

* Mounting plate is made of “scrap” carbon fiber composite plate that was made as a sample in the Mechanical Engineering department composite lab. Coordinated with Bill Kuykendall and found out that small pieces of cured composite are often available if we have use for them on projects. The advantage is that they are small, lightweight, strong, flexible or rigid depending on layup and best of all, free. Also coordinated with the ME lab to cut the composite pieces on a wet saw. Water jest would also work well and I know the AA department manufacturing labs have access to that.

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**1373 – Flight Ops Administration (1702)**

**Content**

As flight operations director, I would like to complete the following tasks to administrate flight operations.

**Definition of Done**

[ ] Coordinate and administrate flight tests

**Notes**

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**1374 – JCATI To-do (1702)**

**Content**

As a lab member, I need to complete the following to make progress on the JCATI 2016 project

**Definition of Done**

[ x] Figure out how Noshad’s gui works

[ x] Run SDR GUI

[ x] Update UDP python script

[ x] Coordinate with MAPPS for flight ops planning

[ x] Plan flight ops for script testing

**Notes**

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**1375 – JCATI LLNL Ground Test**

**Content**

As a lab member, I would like to plan and participate in the LLNL ground test on 3/16/17.

**Definition of Done**

[ ] Develop test cards

[ ] Establish test site location

[ ] Run ground test and collect data

[ ] Analyze data

**Notes**

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**1376 – JCATI Poster**

**Content**

As a lab member, I would like to design the JCATI poster.

**Definition of Done**

[ ] Update current poster to match new design C:\dev\JCATI2016\TechnicalDataPackage\ProjectVision\SDRProjectVision.pptx

[ ] Ensure it is ready for JCATI symposium on 4/4

**Notes**

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**1377 – JCATI SDR Integration & Flight Test**

**Content**

As a lab member, I would like to move forward with SDR integration and flight testing.

**Definition of Done**

[ ] Work with FUNLAB to integrate SDR onto Argo

[ ] Plan flight test

[ ] Decide if we need to fly with dummy load first

[ ] Create test cards

[ ] Conduct flight test

[ ] Post flight analysis

**Notes**

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**1378 – LiDAR Procurement**

**Content**

As a lab member, I would like to move forward with with the LiDAR sensor procurement.

**Definition of Done**

[x] Work with relevant department faculty & staff to put in an order for the LiDAR puck

[x] Coordinate with STF team

**Notes**

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**1379 – Lab Component Inventory**

**Content**

As a lab member, I would like to inventory all of the electronic UAS components in the lab.

**Definition of Done**

[ ] Go through all the boxes in the lab, especially the RC parts boxes, and add everything relevant to the file located here: \FlightOperations\UAS\ComponentTracker.xlsx

[ ] Also look through orange boxes to see if anything was overlooked

[ ] Work with CONDOR team to make sure CONDOR is inventoried

**Notes**

* Check with Hannah with questions

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**1380 – Clean Scissors**

**Content**

As a lab member, I would like to remove the sticky stuff from all of the scissors in the lab.

**Definition of Done**

[ ] Clean the scissors

[ ] Come up with a way to prevent the sticky from returning

**Notes**

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**1381 – Reorganize Lab’s Airspace**

**Content**

As a lab member, in anticipation of more aircraft being added to the fleet, I would like to reorganize the airspace to better accommodate whate we have, and allow for more aircraft to be added.

**Definition of Done**

[ ] Find a way to fit more aircraft, or at minimum de-clutter what we have by moving the strings around

[ ] Do not hang anything from the sprinkler pipes

**Notes**

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**1382 – Repair GROVER**

**Content**

As a lab member, I would like to repair GROVER so that it is fully functional.

**Definition of Done**

[ ] Fix the wheel that falls off

[ ] Address the FPV servo – does it need fixing or replacing?

[ ] Make sure it can follow an auto path flawlessly and is ready to use for swarm research

[ ] Document Fixes at

\FlightOperations\UAS\GROVER\ConstructionAndMaintenenceLog.docx

**Notes**

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## 1383 – New Swarm Research Ground Vehicle

**Content**

As a lab member, I would like to procure and build a new ground vehicle to be used along with GROVER in swarm research.

**Definition of Done**

[ ] Coordinate with swarm team before beginning this user story

[ ] Based on the swarm requirements, and what has been used in GROVER, research parts/systems that will meet these requirements.

[ ] Work with Hannah Rotta to procure parts for the system.

[ ] Assemble the system and perform preliminary testing.

[ ] Document results including:

[ ] Name system

[ ] Create a file/folder infrastructure in the \\FlightOperations\UAS similar to other systems

[ ] Integrate this system into the list of research platforms available to the AFSL

[ ] Incorportate the [ArduRover](http://rover.ardupilot.com/) firmware running on the [Pixhawk](http://store.3drobotics.com/products/3dr-pixhawk) system and communicating to the [Mission Planner](http://planner.ardupilot.com/) ground station software.

[ ] Create and test Waypoints for Ground Rover use

[ ] Create/Verify Simple “Go from A to B” python script

[ ] Verify rover autonomous systems during a ground test

**Notes**

* This project focuses on constructing an autonomous ground vehicle that can be used as a research platform.
* The system can be based off of the GROVER system but can also have variations as deemed appropriate

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**1384 – Flight Training Program – Multi-Rotor (copy)**

**Content**

Copy of user story 1263 – Flight Training Program – Multi-Rotor

**Definition of Done**

Copy definition of done from user story 1263 – Flight Training Program – Multi-Rotor

**Notes**

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**1385 – Plimp Proposal**

**Content**

As a lab member, I would like to create a funding proposal for Plimp.

**Definition of Done**

[ ] Budget

[ ] Fill in gaps that Dr. Lum did not address

**Notes:**

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**1386 – Master’s Thesis Presentation (Larson) (copy)**

**Content**

As a student, I would like to write my Master’s thesis so I can graduate.

**Definition of Done**

[ ] Polish thesis as necessary

[ ] Present thesis results at department wide meeting/presentation on (date TBD)

[ ] Obtain all necessary signatures and documents required for graduation

**Notes**

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**1387 – JCATI To-do (1702) (Copy)**

**Content**

As a lab member, I need to complete the following to make progress on the JCATI 2016 project

**Definition of Done**

[ x] Figure out how Noshad’s gui works

[ x] Run SDR GUI

[ x] Update UDP python script

[ x] Coordinate with MAPPS for flight ops planning

[ x] Plan flight ops for script testing

**Notes**

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## 1388 – Piksi RTK Flight Test (Copy)

**Content**

As a lab member, I would like to work on setting up the Piksi real time kinematics location system and determine its feasibility for use with the JCATI Project.

**Definition of Done**

[ x] Locate documentation and become familiar with it

[ x] Perform ground tests

[ ] Complete 3d printed mounts and ground plates to minimize interference

[ ] Set up mission planner to accept piksi data

[ ] Complete a flight test

**Notes**

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## 1389 – Cera Build (copy)

**Content**

Copy of user story 1365 – Cera Build story

**Definition of Done**

Copy definition of done from user story 1365 – Cera Build

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**1390 – STF Proposal Part 2**

**Content**

As a student, I would like to work with the STF team to finalize the proposal

**Definition of Done**

[x] Work with STF to finish up last minute proposal questions and presentations

**Notes**

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## 1391 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

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**1392 – Flight Training Program – Multi-Rotor (copy)**

**Content**

Copy of user story 1263 – Flight Training Program – Multi-Rotor

**Definition of Done**

Copy definition of done from user story 1263 – Flight Training Program – Multi-Rotor

**Notes**

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**1393 – Flight Training Program**

**Content**

Copy of user story 1127 – Flight Training Program

**Definition of Done**

Copy definition of done from user story 1127 – Flight Training Program

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**1394 – Flight Training Program**

**Content**

Copy of user story 1127 – Flight Training Program

**Definition of Done**

Copy definition of done from user story 1127 – Flight Training Program

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**1395 – Flight Training Program – Multi-Rotor (copy)**

**Content**

Copy of user story 1263 – Flight Training Program – Multi-Rotor

**Definition of Done**

Copy definition of done from user story 1263 – Flight Training Program – Multi-Rotor

**Notes**

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**1396 – Flight Training Program – Multi-Rotor (copy)**

**Content**

Copy of user story 1263 – Flight Training Program – Multi-Rotor

**Definition of Done**

Copy definition of done from user story 1263 – Flight Training Program – Multi-Rotor

**Notes**

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**1397 – Flight Training Program – Multi-Rotor (copy)**

**Content**

Copy of user story 1263 – Flight Training Program – Multi-Rotor

**Definition of Done**

Copy definition of done from user story 1263 – Flight Training Program – Multi-Rotor

**Notes**

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## 1398 – VTOL/QuadPlane (copy)

**Content**

Copy of user story 1352 – VTOL/QuadPlane**Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story 1352 – VTOL/QuadPlane

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## 1399 – VTOL/QuadPlane (copy)

**Content**

Copy of user story 1352 – VTOL/QuadPlane**Error! Reference source not found.**

**Definition of Done**

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## 1400 – VTOL/QuadPlane (copy)

**Content**

Copy of user story 1352 – VTOL/QuadPlane**Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story 1352 – VTOL/QuadPlane

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## 1401 – Create an AFSL Promo Video for the Website

**Content**

As a lab member, I would like to create a video for the website promoting the lab.

**Definition of Done**

[ ] Shoot additional footage of the lab in action

[ ] Find valuable existing footage

[ ] Compile a short movie to upload to website

[ ] Show to group

[ ] Upload to website (work with Karine Chen)

**Notes**

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## 1402 – Create an AFSL Promo Video for the Website (copy)

**Content**

Copy of user story 1401 – Create an AFSL Promo Video for the Website**Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story 1401 – Create an AFSL Promo Video for the Website

**Notes**

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## 1403 – Create an AFSL Promo Video for the Website (copy)

**Content**

Copy of user story 1401 – Create an AFSL Promo Video for the Website**Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story 1401 – Create an AFSL Promo Video for the Website

**Notes**

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## 1404 – Student Technology Fee Proposal (copy) – LIDAR

**Content**

Copy of user story 479 – Student Technology Fee Proposal

## 1405 – Aircraft Part Familiarization (copy)

**Content**

Copy of user story 1263 – Flight Training Program – Multi-Rotor

As an equipment technician, I would like to learn about each component that is a part of the UAV.

**Definition of Done**

Familiarization with:

[ ] Servos, push rods, and control horns  
[ ] Motor and propeller  
[ ] Pixhawk  
[ ] Pixhawk connections including:

* Telemetry radio
* Power module
* Electronic Speed Controller (ESC)
* Buzzer and its various sounds
* Arm/disarm switch
* GPS
* External USB port
* Airspeed sensor

[ ] Motor and battery safety switches

[ ] LiPO batteries

[ ] Basic FPV apparatuses (i.e. Mobius camera, A/V Transmitter)

**Notes**

## 1418 – BVLOS Waiver

**Content**

As a researcher, I would like apply for a waiver to fly beyond visual line of sight.

**Definition of Done**

[ ] Research waiver requirements \FlightOperations\Operations\COWs\Part107Waiver\_Instructions.pdf and \FlightOperations\Operations\COWs\Part107Waiver\_PerformanceBasedStandards.pdf

[ ] Research what other people have done to get this waiver previously

[ ] Refer to AFSL’s altitude waiver for inspiration \FlightOperations\Operations\COWs\AltitudeWaiver\107W-2016-01765\_51bsigned.pdf

[ ] Ensure our aircraft can meet requirements

[ ] Write waiver

[ ] Ensure waiver is peer reviewed

[ ] Submit

**Notes**

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## 1419 – Aircraft Lights for Altitude Waiver

**Content**

As a lab member, I would like to procure and install the lights necessary to be compliant with the FAA alititude waiver, that will allow our aircraft to be visible from 1 mile away. These will initially be installed on TEDD and Argo.

**Definition of Done**

[ ] Talk to Karine about light research and briefly do your own research to determine the best lights for our aircraft. Some example features we may want:

[ ] High visibility (minimum 1 mile daytime)

[ ] Easily integrated

[ ] Can run off LiPo battery (separate from normal aircraft battery) and stay lit for the duration of one or more flights (minimum 20 minutes)

[ ] Aviation colors – red, white and green (ideal but not a requirement)

[ ] Works for fixed wing and multi-rotor aircraft

[ ] Talk to Hannah about purchasing the lights

[ ] Install on TEDD and Argo

[ ] Write up documentation for use

[ ] Add documentation folder to \FlightOperations\UAS\CommonDocuments\

[ ] Write and integrate operational checklist into current UAS checklists

**Notes**

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## 1420 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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## 1421 – Research Mission Planner

**Content**

As a lab member, I would like to research how to create executable python scripts in Mission planner and how to create custom parameter and flights modes.

**Definition of Done**

[ ] Develop pythons script that can send UDP packets to MatLAB

[ ] Develop a custom version of mission planner with at least one custom parameter and flight mode

**Notes**

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**1422 – Flight Training Program – Multi-Rotor (part 1)**

**Content**

As a future sUAS pilot, I would like to complete the AFSL required training to become eligible to fly the lab’s multi-rotor aircraft.

**Definition of Done**

[x ] Before anything else, read the training information located here: **\FlightOperations\Operators\Training\FlightTrainingInformation.docx**

[ ] Log at least three hours of productive simulator time on PhoenixRC on the computer nearest the door. Please use a multi-rotor model. Additional time may be spent on other airframes, but a minimum three hours on a multi-rotor are required. This includes the following:

[ ] Log at least three hours here in the gray section of this document: **\FlightOperations\Operators\Training\FlightTrainingRecords.xlsx**

[ ] Practice takeoffs

[ ] Practice hovering/loitering and other basic maneuvers

[ ] Practice reverse orientation flying

[ ] Perform 15 safe landings on a Dead Calm day (weather can be adjusted in the settings)

[ ] Perform 15 safe landings on a Brisk day

[ ] Perform 15 safe landings on a Fair Wind day

[ ] Demonstrate to a lead pilot proficiency on takeoff, cruise, reverse orientation and landing

**1423 – RF Spectrum Analyzer Manual**

**Content**

As a lab member, I would like to complete the user story on the weather station and complete the manual for the RF spectrum analyzer, which has now been found.

**Definition of Done**

[x] Locate the RF Spectrum Analyzer  
[x] Write an AFSL Publication detailing the standard operation of the RF Spectrum Analyzer  
[x] Update the AFSL Publication Numbers document

## 1424 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

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**Notes**

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## 1425 – Perforce Visual Client (copy)

**Content**

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**Definition of Done**

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## 1426 – Perforce Visual Client (copy)

**Content**

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**Definition of Done**

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**Notes**

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## 1427 – Auto Takeoff

**Content**

As a lab member, I would like to research how to have our fixed wing aircraft perform auto takeoffs.

**Definition of Done**

[ ] Research what is required to perform an auto takeoff. This could include researching what other people do, what capabilities Mission Planner has for this, and what on-board technology the aircraft needs.

[ ] What parameters need to be set in ArduPlane?

[ ] What waypoints/commands need to be set in Mission Planner?

[ ] Does the PIC have any control authority during auto takeoff? Or do they need to switch out of auto mode if they need to “nudge” the plane one way or another?

[ ] What happens if you lose comms or otherwise experience an emergency during auto takeoff?

[ ] Draft a test card to experiment with this system on Anakin.

[ ] Determine if auto takeoffs will increase safety, success and/or ease of flight during our operations. Baically, is this better than taking off in manual/stabilize then switching over to auto once we’ve reached altitude?

[ ] Present findings to research group.

**Notes**

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## 1428 – Auto Landing

**Content**

As a lab member, I would like to research how to have our fixed wing aircraft perform auto landings. I will confer with the development champion of user story 1427 – Auto Takeoff to glean relevant info from what they learned.

**Definition of Done**

[ ] Research what is required to perform an auto landing. This could include researching what other people do, what capabilities Mission Planner has for this, and what on-board technology the aircraft needs.

[ ] What parameters need to be set in ArduPlane?

[ ] What waypoints/commands need to be set in Mission Planner?

[ ] Does the PIC have any control authority during auto landing? Or do they need to switch out of auto mode if they need to “nudge” the plane one way or another?

[ ] What happens if you lose comms or otherwise experience an emergency during auto landing?

[ ] Draft a test card to experiment with this system on Anakin if this is something we can accommodate.

[ ] Determine if auto landings will increase safety, success and/or ease of flight during our operations. Baically, is this better than landing in manual/stabilize then switching over to auto once we’ve reached altitude?

[ ] Present findings to research group.

**Notes**

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## 1429 – DJI Phantom 3 Usage Study

**Content**

As a lab member, I would like to research whether or not the DJI Phantom 3 is a viable platform for our lab’s operations.

**Definition of Done**

[ ] Research the basics of the DJI Phantom 3 and determine

[ ] What is its payload capacity?

[ ] Can you generate flight paths offline (i.e. in the lab then upload them later)?

[ ] Can the default camera be used for creating geo-tagged images?

[ ] Can the default gimbal be removed and can we mount another camera on it (such as the RedEdge)?

[ ] How might AFSL use the Phantom for research?

[ ] Is this a viable platform for AFSL? Is it better or worse than what we have, or a good alternative?

[ ] Present findings to research group.

**Notes**

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## 1430 – GCS Software Upgrades

**Content**

As a lab member, I would like to investigate upgrading our Mission Planner and ArduCopter/Plane/Rover software across the fleet.

**Definition of Done**

[ ] Research what has changed between the software we are using and the newer versions by reading online release notes and documentation for Mission Planner

[ ] Decide if we want to use MP 1.3.48 or 1.3.49

[ ] You can download 1.3.49 onto a computer to play around with it to see if anything looks weird or dangerous (<http://firmware.us.ardupilot.org/Tools/MissionPlanner/>)

[ ] If you use the .msi it will write over previous versions, but if you just paste in the .zip file it should keep the older versions as well

[ ] Save the program files to \FlightOperations\UAS\CommonDocuments\MissionPlanner\binaries\_and\_installers\mission\_planner\

[ ] Ensure that this new version creates Matlab files for both tlogs and data flash logs

[ ] Install this new version on all lab computers (don’t write over the previous versions)

[ ] Ensure that this new version is the default one that opens on all computers

**Notes**

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**1431 – New Swarm Research Ground Vehicle (copy)**

**Content**

Copy of user story 1383 – New Swarm Research Ground Vehicle

**Definition of Done**

Copy definition of done from user story 1383 – New Swarm Research Ground Vehicle

**Notes**

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**1432 – New Swarm Research Ground Vehicle (copy)**

**Content**

Copy of user story 1383 – New Swarm Research Ground Vehicle

**Definition of Done**

Copy definition of done from user story 1383 – New Swarm Research Ground Vehicle

**Notes**

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**1433 – New Swarm Research Ground Vehicle (copy)**

**Content**

Copy of user story 1383 – New Swarm Research Ground Vehicle

**Definition of Done**

Copy definition of done from user story 1383 – New Swarm Research Ground Vehicle

**Notes**

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## 1434 – Multi-Rotor Training Document

**Content**

As a multi-rotor pilot, I would like to write up the documentation necessary for someone brand new to have an introduction to multi-rotor training and flying.

**Definition of Done**

[ ] Write a comprehensive document that outlines all aspects of flying a multi-rotor aircraft, similar to the fixed wing document: \FlightOperations\Operators\Training\FlightTrainingInformation.docx. Should fixed wing and multi-rotor be on the same, or separate documents?

[ ] This should be written such that someone who knows nothing prior, can read it and have all (or at least most of) the knowledge necessary that with simulator time and in person training in the field, they will be a proficient multi-rotor pilot.

[ ] Include must know items, valuable tips and tricks and other useful commentary.

**Notes**

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## 1435 – Self-Contained FPV Research

**Content**

As a lab member, I would like to research the feasibility of using self-contained FPV systems on our aircraft. These systems would merely need to be mounted/taped to an aircraft, and connected to power.

**Definition of Done**

[ ] Find various examples of purchaseable self-contained FPV systems.

[ ] Create a spreadsheet comparing these systems, and our current FPV gear. Relevant fields include:

* cost
* resolution
* power requirements
* transmission range
* transmission technology and frequency
* special applications and features

[ ] Present findings to the lab.

**Notes**

## 1436 – MAPSS Vibration Sensor Acquisition and Testing

**Content**

As a MAPSS member, I would like to purchase and test the use of a vibration sensor for collection in-flight vibration data.

**Definition of Done**

[ ] Find various Vibration Sensors online to purchase

[ ] Purchase Vibration Sensor

[ ] Document Vibration Sensor

[ ] Test the Vibration Sensor

[ ] Show results to MAPSS members

**Notes**

Ask Spenser or Fiona for advice if need be.

## 1437 – MAPSS Shaker Table Testing (Part 1)

**Content**

As a MAPSS member, I would like to use the AA shaker table to produce high-level trade studies regarding the dampening plate design (eg number & layout of rubber balls).

**Definition of Done**

[ ] Create appropriate “test cards” for desired Shaker Table Tests

[ ] Research Shaker Table Interface

[ ] Manufacture dampening plate designs

[ ] Schedule time to conduct tests (Contact Professor Yang)

[ ] Test and clean up properly

[ ] Present results to MAPSS members

**Notes**

## 1438 – MAPSS Gimbal Structural Component Research

**Content**

As a MAPSS member, I would like to research the effectiveness of gimbal components (L-brackets / rods / bent plates) , for use in design components.

**Definition of Done**

[ ] Research gimbal components

[ ] Determine important characteristics and best uses/designs

[ ] Present results to MAPSS members

**Notes**

## 1439 – MAPSS FLIR VUE Plate Design

**Content**

As a MAPSS member, I would like to design the FLIR VUE plate for integrating this camera system into the camera payload plate

**Definition of Done**

[ ] Design FLIR VUE plate via Solidworks

[ ] Save as DXF file for manufacturing

[ ] Upload to Perforce

**Notes**

## 1440 – MAPSS FLIR VUE Plate Manufacturing

**Content**

As a MAPSS member, I would like to manufacture the integration plate for the FLIR VUE.

**Definition of Done**

[ ] Work with member responsible for 1439 – MAPSS FLIR VUE Plate Design

[ ] Oversee manufacturing of plate

[ ] Document manufacturing procedure (w/ pictures/video)

[ ] Assemble FLIR VUE integration

[ ] Present Results to group

**Notes**

## 1441 – MAPSS Prototype 2 Reconstruction

**Content**

As a MAPSS member, I would like to reconstruct Prototype 2 for the next flight test.

**Definition of Done**

[ ] Choose reconstruction option (L-Brackets or different material)

[ ] Gather Supplies needed to reconstruct P2

[ ] Manufacture P2

[ ] Document manufacturing process / assembly (Pictures/Videos)

[ ] Show results to MAPSS group

**Notes**

## 1442 – MAPSS Camera Payload Plate Final Design

**Content**

As a MAPSS member, I would like to finalize the design of the camera payload plate.

**Definition of Done**

[ ] Design plate in Solidworks

[ ] Verify plate design with rest of MAPSS team

[ ] Manufacture Plate

[ ] Document manufacturing methods (Pictures / Video)

**Notes**

## 1443 – MAPSS FLIR VUE model reprint/reweigh

**Content**

As a MAPSS member, I would like to reprint/reweigh Flir Vue model

**Definition of Done**

[ ] Modify manufacturing procedure / Add weight to the model

[ ] Weight the model

**Notes**

## 1444 – MAPSS Flight Test Readiness

**Content**

As a MAPSS member, I would like to be responsible for MAPSS Flight Testing and updating flight cards.

**Definition of Done**

[ ] Talk with Hannah for upcoming flight test dates

[ ] Prioritize flight test preparation and readiness

[ ] Talk with Zach Williams as a designated pilot for weekday flight tests

[ ] Update and manage flight test cards for gathering the most amount of data

**Notes**

## 1445 – MAPSS Carbon Fiber Supply

**Content**

As a MAPSS member, I would like to be responsible for MAPSS Carbon fiber supply for future manufacturing.

**Definition of Done**

[ ] Research ARIBA companies for carbon fiber supplies

[ ] Purchase plates

**Notes**

## 1446 – MAPSS Electrical System Research

**Content**

As a MAPSS member, I would like to be responsible for researching electrical integration for the MAPSS cameras and gimbal controller.

**Definition of Done**

[ ] Research voltages needed to run each component

[ ] Research voltage output by battery (battery drain estimates)

[ ] Research / purchase electrical components necessary

[ ] Test setup WITHOUT components

[ ] Verify setup before continuing

[ ] Test setup WITH components

**Notes**

## 1447 – MAPSS Prototype 3 Design

**Content**

As a MAPSS member, I would like to be responsible for designing MAPSS Prototype 3

**Definition of Done**

[ ] Choose best practices for integrating structure

[ ] Design parts in Solidworks

[ ] Verify design with teammates

**Notes**

Remember to prioritize weight, size, and manufacturability

P3 Manufacturing starts 1st week of spring quarter

## 1448 – MAPSS Prototype 3 Design (copy)

**Content**

Copy of 1447 – MAPSS Prototype 3 Design

## 1449 – MAPSS Prototype 3 Design (copy)

**Content**

Copy of 1447 – MAPSS Prototype 3 Design

## 1450 – MAPSS Prototype 3 Design (copy)

**Content**

Copy of 1447 – MAPSS Prototype 3 Design

## 1451 – MAPSS Camera Payload Plate Final Design (copy)

**Content**

Copy of 1442 – MAPSS Camera Payload Plate Final Design

## 1452 – MAPSS Prototype 2 Design and Construction

**Content**

As a MAPSS member, I would like to be responsible for designing/manufacturing MAPSS Prototype 2

**Definition of Done**

[ ] Choose best practices for integrating structure

[ ] Design parts in Solidworks

[ ] Verify design with teammates

[ ] Construct components

[ ] Assemble Prototype 2

**Notes**

Proof of concept prototype

* Will need to be reconstructed due to wear on Aluminum 6061 bends

## 1453 – MAPSS Prototype 2 Design and Construction (copy)

Copy of 1452 – MAPSS Prototype 2 Design and Construction

## 1454 – MAPSS Prototype 2 Design and Construction (copy)

Copy of 1452 – MAPSS Prototype 2 Design and Construction

## 1455 – MAPSS Prototype 2 Design and Construction (copy)

Copy of 1452 – MAPSS Prototype 2 Design and Construction

## 1456 – Social Media Updates (copy) – APR ’17

**Content**

Copy of user story 1082 – Social Media Updates

As a lab member, I would like to update the activities of the lab for publicity on the AFSL website, Facebook, and YouTube pages.

**Definition of Done**

[x] Consult with Chris Lum on the activity’s description and prospective posting photos/videos.

[x] Frequently post profiles of lab members and their specific involvement in the lab on Facebook.

For every post-flight test:

[x] Upload selected videos from the flight test onto YouTube.

[x] Update the video description (follow the template on YouTube)

[x] Make sure each video tag includes: university of washington autonomous flight systems laboratory uw afsl test (schoolyear e.g. 20162017) (date e.g. 20161119) (location e.g. meadowbrooke farm) (UAS e.g. tedd) run (run# e.g. 001) (title)

[x] everything is in lowercase

[x] every word has a space in between

[x] exclude all the parenthesis

[x] Make sure the uploaded videos are included in their perspective playlists (it is possible for each video to be in more than one playlist)

[x] Share the videos uploaded onto YouTube on Facebook.

[x] Upload selected photos from the flight test onto Facebook.

[x] Confirm that the photos and videos from each flight test are uploaded onto K drive.

Flight Test:

[x] 20170401 @ Sixty Acres

[x] 20170406 @ Sixty Acres

[x] 20170408 @ Meadowbrooke Farm

[x] 20170415 @ Sixty Acres

[x] 20170420 @ Sixty Acres

[x] 20170429 @ Meadowbrooke Farm

[x] 20170504 @ Sixty Acres

[x] Include every additional Flight Test from this quarter here…

[x] At the end of the quarter, please make a new copy user story 1082 – Social Media Updates for the next quarter.

**Notes**

* This is a quarter long commitment, please only pick it up if you can make the time.
* Every flight test for the quarter is to be included under Flight Test.
* Every video and photo needs to be in its best quality, meaning the videos are to be trimmed, and photos to be cropped if deemed necessary.
* Uploaded videos are automatically distributed into its perspective playlists if tagged correctly.
* Uploaded videos will automatically be shared through Twitter.
* Q&A about video tag: “school year (e.g. 20162017)” is considered from first day of summer courses of that year to the day before the first day of summer courses for the following year.

**1457 – Flight Training Program – Multi-Rotor (copy)**

**Content**

Copy of user story 1263 – Flight Training Program – Multi-Rotor

**Definition of Done**

Copy definition of done from user story 1263 – Flight Training Program – Multi-Rotor

**Notes**

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**1458 – Flight Training Program**

**Content**

Copy of user story 1127 – Flight Training Program

**Definition of Done**

Copy definition of done from user story 1127 – Flight Training Program

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| Simulator time was very beneficial in preparation for the actual flying. The more time I spent with the transmitter in my hand, the more natural the controls felt and the smoother the flying became. |

## 1459 – Troubleshoot CERES (Part 2)

**Content**

As a lab member, I would like to troubleshoot the high servo latency and make CERES airworthy again.

**Definition of Done**

[ ] Troubleshoot why CERES’ servos are not responsive

[ ] Fix the problem

[ ] Make sure CERES is airworthy again

**Notes:**

From 12/17/16 mission notes:

Ceres not airworthy. Need to troubleshoot the high latency between the receiver and the AC. It is not responding to the commands smoothly or immediately. GCS received “NO RC Receiver” warning intermittently during the preflight checks

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## 1460 – 3DR Solo Usage Study

**Content**

As a lab member, I would like to research whether or not the 3DR Solo is a viable platform for our lab’s operations.

**Definition of Done**

[ ] Research the basics of the 3DR Solo and determine

[ ] What is its payload capacity?

[ ] Can you generate flight paths offline (i.e. in the lab then upload them later)?

[ ] Can the default camera be used for creating geo-tagged images?

[ ] Can we mount equipment on the bottom of it easily?

[ ] How might AFSL use the Solo for research?

[ ] Is this a viable platform for AFSL? Is it better or worse than what we have, or a good alternative?

[ ] Present findings to research group.

**Notes**

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**1461 – Master’s Thesis Polishing (Larson) (copy)**

**Content**

As a student, I would like to write my Master’s thesis so I can graduate.

**Definition of Done**

[ ] Revise thesis rough draft per comments from committee members.

[ ] Clean up figures, double check calculations, verify correct citations, etc.

**Notes**

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**1462 – AIAA SciTech Conference Paper Draft Writing (copy)**

**Content**

As a student, I would like to summarize my research in a conference paper submission while working on relevant sections of my thesis so I can graduate

**Definition of Done**

[ ] Write relevant sections of thesis to be added to conference paper

[ ] Ensure mathematical modeling for estimators is sound within flight tracking context

**Notes**

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## 1463 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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## 1464 – Auto Takeoff (copy)

**Content**

Copy of user story 1427 – Auto Takeoff

**Definition of Done**

Copy definition of done from user story 1427 – Auto Takeoff

**Notes**

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## 1465 - MAPSS File Uploading

**Content**

As a MAPSS member, I would like to upload and continually maintain MAPSS files onto Perforce.

**Definition of Done**

[ ] Upload all files onto Perforce

[ ] Maintain MAPSS file maintanence on Perforce

**Notes**

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## 1466 – MAPSS MTF Poster Creation (Part 2)

**Content**

As a MAPSS member, I would like to create a poster for gathering MTF data

**Definition of Done**

[ ] Create squares to gather MTF data from

[ ] Create Background for MTF testing using thermal imaging

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## 1467 – MAPSS Prototype Iteration

**Content**

As a MAPSS member, I would like to be responsible for designing/manufacturing upon the latest prototype

**Definition of Done**

[ ] Decide with teammates what needs to be updated

[ ] Design parts in Solidworks

[ ] Verify design with teammates

[ ] Construct components

[ ] Assemble

**Notes**

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## 1468 – MAPSS Prototype Iteration (copy)

Copy of 1467 – MAPSS Prototype Iteration

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## 1469 – MAPSS Prototype Iteration (copy)

Copy of 1467 – MAPSS Prototype Iteration

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## 1470 – MAPSS Prototype Iteration (copy)

Copy of 1467 – MAPSS Prototype Iteration

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## 1471 – MAPSS Manufacturability Trade Study

**Content**

As a MAPSS member, I would like to be responsible for researching available methods of manufacturing our gimbal components.

**Definition of Done**

[ ] Researching different manufacturing methods to create gimbal components

[ ] Research viable locations to acquire materials and perform manufacturing

**Notes**

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## 1472 – MAPSS Manufacturability Trade Study (copy)

Copy of 1471 – MAPSS Prototype 4 Design and Construction

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## 1473 – Part 107 Test Preparation (copy)

**Content**

Copy of user story 1352 – VTOL/QuadPlane**Error! Reference source not found.**

As a researcher, I would like to prepare for and take the FAA Part 107 Commercial Remote Pilot Certification test.

**Definition of Done**

[X] Take the online course offered by the FAA

[X] Take the three practice tests on the network drive (Bought a personal cop of the prep book and took the practice tests at home.)

[X] Study all topics identified as weak when taking practice tests

[X] Take the part 107 test

[X] Do the paperwork to get the license from the FAA

[X] Do the paperwork to get reimbursed for test

**Notes**

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| The test prep book is very good preparation for the exam although cannot possibly include all the different questions that might be on the test. I was also disappointed with the format of the original test and wished it had been more like the online practice tests. Passed the official test with no problem in just the one attempt. |

**1474 – CONDOR Post-Mortem Analysis**

(Copy of 1168)

**Content**

As lab member, I would like to conduct a CONDOR post-mortem analysis to determine what the cause of failure was.

**Definition of Done**

[X ] Systematically determine what went wrong

[X ] Investigate each part to see if it is working properly

* + be sure to mark broken ones on inventory log: \FlightOperations\UAS\ComponentTracker.xlsx

[X] Investigate the data logs for clues

[X] Release back into circulation any components that are working and undamaged

[X] Report to stakeholders of findings so crash isn’t repeated

**Notes**

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| Summary: Upon entering Autotune mode, the aircraft pitched downward and became unresponsive to the pilot resulting in a crash into trees before a recovery was possible. Many factors play into Autotune mode and thorough preparation of the aircraft and aircraft systems should be made before attempting an autotune. |

## 1475 – Aircraft Lights Preliminary Integration (Ben)

**Content**

As a lab member, I would like to integrate lights onto Ben for testing.

**Definition of Done**

[x] Coordinate with Chris Lum before starting this user story.

[x] Research the lights to be integrated that is approved by the altitude waiver.

[x] Integrate navigational lights on Ben.

[x] Integrate strobe light on Ben.

[ ] Test fly Ben at a flight test and discuss results.

**Notes**

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## 1476 – Request a Waiver for sUAS – BVLOS

**Content**

As a lab member, I would like to request a waiver for sUAS with the FAA so that I can increase the radius of the flight beyond visual line of sight of 3 miles.

**Definition of Done**

[x] Coordinate with Chris Lum before starting this user story.

[x] Read the form instructions (\FlightOperations\Research\FAA\instructions.pdf) and  the [list of regulations subject to waiver](https://www.faa.gov/uas/beyond_the_basics/#waiver) prior to filling the online form.

[x] Filling the online form that is located at <https://www.faa.gov/uas/request_waiver/>.

[x] Discuss the drafted form with lab members before submitting.

[x] Submit the revised form.

**Notes**

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## 1477 – Request a Waiver for sUAS – Swarm

**Content**

As a lab member, I would like to request a waiver for sUAS with the FAA so that I can increase the radius of the flight beyond visual line of sight of 3 miles.

**Definition of Done**

[x] Coordinate with Chris Lum before starting this user story.

[x] Read the form instructions (\FlightOperations\Research\FAA\instructions.pdf) and  the [list of regulations subject to waiver](https://www.faa.gov/uas/beyond_the_basics/#waiver) prior to filling the online form.

[x] Filling the online form that is located at <https://www.faa.gov/uas/request_waiver/>.

[ ] Discuss the drafted form with lab members before submitting.

[ ] Submit the revised form.

**Notes**

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## 1478 – JCATI Pitch & Symposium

**Content**

As a lab member, I would like to prepare a script for the JCATI pitch competition and build a single powerpoint slide

**Definition of Done**

[ ] Create the powerpoint slidie

[ ] Complete edits for the slide

[ ] Write the script for the competition

[ ] Practice delivering the pitch at lab group meeting

[ ] Man the poster at the symposium

**Notes**

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## 1479 – JCATI Pitch & Symposium (copy)

**Content**

As a lab member, I would like to prepare a script for the JCATI pitch competition and build a single powerpoint slide

**Definition of Done**

[ ] Create the powerpoint slidie

[ ] Complete edits for the slide

[ ] Help write the script for the competition

[ ] Man the poster during the symposium

**Notes**

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## 1480 – JCATI Flight Test I

**Content**

As a lab member, I would like to prepare a script for the JCATI pitch competition and build a single powerpoint slide

**Definition of Done**

[ ] Install the new power module to build a model for battery drain

[ ] Map channel 7 to AUX 6 and wire AUX 6 to the raspberry pi

[ ] Finalize waypoint files

[ ] Double check that software is operational

[ ] Organize how data will be collected

[ ] Execute the flight test (weather permitting)

**Notes**

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## 1481 – JCATI Flight Test I (copy)

**Content**

As a lab member, I would like to prepare a script for the JCATI pitch competition and build a single powerpoint slide

**Definition of Done**

[ ] Install the new power module to build a model for battery drain

[ ] Map channel 7 to AUX 6 and wire AUX 6 to the raspberry pi

[ ] Finalize waypoint files

[ ] Double check that software is operational

[ ] Organize how data will be collected

[ ] Execute the flight test (weather permitting)

**Notes**

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## 1482 – Equipment Verification

**Content**

As an equipment technician, I would like to ensure that the telemetry radios used on the aircraft are standardized.

**Definition of Done**

[ ] Ensure the 3DR radios (ONLY the knock-off brand radios) are of the correct gender to communicate with the GCS  
[ ] Ensure Pixhawk contains microSD card

**Notes**

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## 1483 – AIAA SciTech Paper JCATI2016

**Content**

As a JCATI2016 team member, I would like to summarize my research in a conference paper submission.

**Definition of Done**

[ ] Write relevant sections paper, as assigned in the outline

**Notes**

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**1484 – AIAA SciTech Paper JCATI2016 (copy)**

**Content**

Copy of user story 1483 – AIAA SciTech Paper JCATI2016

**Definition of Done**

Copy definition of done from user story 1483 – AIAA SciTech Paper JCATI2016

**Notes**

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**1485 – AIAA SciTech Paper JCATI2016 (copy)**

**Content**

Copy of user story 1483 – AIAA SciTech Paper JCATI2016

**Definition of Done**

Copy definition of done from user story 1483 – AIAA SciTech Paper JCATI2016

**Notes**

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## 1486 – Publishing JCATI Data Online

**Content**

As a member of the JCATI 2016 team, I would like to look into posting the JCATI data to a public website.

**Definition of Done**

[ ] Figure out how to host this on the AFSL website

[ ] Does it need to link to something like the K drive, or Azure?

**Notes**

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## 1487 – Research New Pixhawks

**Content**

As a lab member, I would like to research where we can purchase a replacement for the 3DR Pixhawk.

**Definition of Done**

[ ] Look for the best replacement for the 3DR Pixhawk (3DR is getting out of the manufacturing of small electronics, but there are knockoff brands out there)

[ ] Consider HobbyKing for options, but also look elsewhere

[ ] Is there something better than the Pixhawk?

[ ] Find the best place to also purchase a Pixhawk 2

**Notes**

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**1488 – Flight Training Program (copy)**

**Content**

Copy of user story 1127 – Flight Training Program

**Definition of Done**

Copy definition of done from user story 1127 – Flight Training Program

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## 1489 – Perforce Visual Client (copy)

**Content**

Copy of user story **Error! Reference source not found.**

**Definition of Done**

Copy definition of done from user story **Error! Reference source not found.**

**Notes**

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## 1490 – Investigate INEXA

**Content**

As a lab member, I would like to investigate using Insitu’s INEXA as a GCS.

**Definition of Done**

[ ] TBD

**Notes**

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## 1491 – Updating AIAA Conference Paper (Position 1)

**Content**

As a lab member, I would like to complete edits on the AIAA AVIATION paper for the final submission.

**Definition of Done**

[ ] Update old ADS-B and LAMS plots

[ ] Ensure figure labels and plots make sense with the new plots

[ ] Ensure the results section is complete

[ ] Update color scheme for flight path (located in Conference paper 2) figures

[ ] Meet with Dr. Lum to work out any other details that need to be discussed in paper

**Notes**

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**1492 – Build MATLAB Script for Real-Time Modeling**

**Content**

As a lab member, I would like to build a MATLAB script for real-time modeling data from the LiDAR sensor.

**Definition of Done**

[ ] Create a script with the following requirements (not limited to):

[ ] Be able to import .pcap files.

[ ] Be able to mport excel files.

[ ] Be able to import any other file types that the data is generated in.

[ ] Generate a 3D point cloud model of the data that can be moved in between timelines.

[ ] Be able to compare multiple flight test data in the same graph.

[ ] Utilize color coding to visualize the differences.

**Notes**

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## 1493 – MATLAB for ArduCopter Battery Info

**Content**

As a lab member, I would like to edit the MATLAB code for running arducopter data flash logs such that it properly displays the current and voltage data.

**Definition of Done**

[ ] Fix MATLAB code so that it plots the current and voltage data for arducopter.

**Notes**

* Specifically we need it for Argo.
* You can use the arduplane code for a reference

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**1494 – Flight Ops Administration (1703)**

**Content**

As flight operations director, I would like to complete the following tasks to administrate flight operations.

**Definition of Done**

[ ] Coordinate and administrate flight tests

[ ] Coordinate and administrate ground tests

[ ] Coordinate flight training

[ ] Other administrative stuff

**Notes**

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**1495 – Donated Drone Investigation**

**Content**

As lab member, I would like to look into the new, donated drone and figure out what we can do with it.

**Definition of Done**

[ ] Unpack box

[ ] What is required to put it together?

[ ] Figure out what we want to do with it.

[ ] Either put it in storage, or put it together

**Notes**

* Depending on what we decide to do with it, this user story could be a L or XL

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**1496 – JCATI 1703 Tasks**

**Content**

As lab member working on the JCATI 2016 project, I’d like to make progress on the SDR integration.

**Definition of Done**

[ ] Work with Abhinav to resolve GPS timing issues

[ ] Plan flight tests

[ ] Assorted tasks throughout the month

**Notes**

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**1497 – DJI Phantom 3 MicaSense Mount**

**Content**

As lab member, I would like to create a MicaSense RedEdge mount for the DJI Phantom 3 Professional.

**Definition of Done**

[x] Draft ideas for a bottom-mounted RedEdge mount

[x] Lasercut or 3D print the idea

[x] Perform an indoor test flight and verify that the DJI Phantom 3 Professional can handle the internal weight.

[x] Weigh the added mass to the DJI Phantom 4 Professional

[ ] Perform an outdoor test flight and verify that the DJI Phantom 4 Professional can complete a predetermined circuit

**Notes**

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**1498 – Solder AA Battery Housing**

**Content**

As lab member, I would like to solder connectors to the AA battery pack.

**Definition of Done**

[ ] Find appropriate connectors

[ ] Solder AA battery packs

**Notes**

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**1499 – Turnigy 9X Buddy Box**

**Content**

As lab member, I would like to figure out how to make the buddy boxing work with the Turnigy 9X transmitter.

**Definition of Done**

[ ] Research how to make the buddy boxing work online or see if there is documentation on perforce

[ ] Get buddy boxing working on GROVER

**Notes**

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**1500 – Checklist Formatting**

**Content**

As lab member, I would like to convert our word doc checklists into excel.

**Definition of Done**

[ ] Figure out the best way to move our checklists into excel to make them easier to work with

[ ] Check with Hannah once you have an idea and get it approved

[ ] Convert all checklists

**Notes**

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